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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 11, 1983 Volume 1035 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,642,930, Re. S.N. 528,860, Filed Sept. 2, 1983, Cl. 585/608, PROCESS FOR THE MANUFACTURE OF ISOPRENE FROM ISOAMYLENSES AND METHYL BUTANOLS AND CATALYSTS THEREFOR, Robert K. Grosselli, et al., Owner of Record: *Standard Oil Co., Cleveland, Ohio,* Attorney or Agent: Ford F. Farabow, Jr., Ex. Gp.: 110

3,897,596, Re. S.N. 515,217, Filed July 20, 1983, Cl. 2/003R, PROTECTIVE HELMET, Jackson A. Aileo, et al., Owner of Record: *Gertex Corp., Carbondale, Pa.,* Attorney or Agent: Henry L. Shenier, et al., Ex. Gp.: 353

3,915,693, Re. S.N. 517,670, Filed July 26, 1983, Cl. 75/53, PROCESS, STRUCTURE AND COMPOSITION RELATING TO MASTER ALLOYS IN WIRE OR ROD FORM, Robert T. C. Rasmussen, Owner of Record: *Inventor,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 111

4,094,801, Re. S.N. 484,007, Filed Apr. 18, 1983, Cl. 252/33, MAGNESIUM-CONTAINING COMPLEXES, METHOD FOR THEIR PREPARATION, AND COMPOSITIONS CONTAINING THE SAME, John W. Forsberg, Owner of Record: *Lubrizol Corp., Wickliffe, Ohio,* Attorney or Agent: Armand P. Boisselle, Ex. Gp.: 116

4,260,106, Re. S.N. 489,674, Filed Apr. 28, 1983, Cl. 239/11, FLUIDIC OSCILLATOR WITH RESONANT INERTANCE AND DYNAMIC COMPLIANCE CIRCUIT, Peter Bauer, Owner of Record: *Inventor,* Attorney or Agent: B. Franklin Griffin, Jr., et al., Ex. Gp.: 313

4,265,766, Re. S.N. 466,206, Filed Feb. 14, 1983, Cl. 210/455, CHICKEN MARINADE DRAINING SYSTEM, Leonard S. Crossley, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 176

4,276,729, Re. S.N. 510,980, Filed July 5, 1983, Cl. 52/209, FLASHING CONSTRUCTION FOR A CURTAIN WALL, Yoshinobu Shiga, et al., Owner of Record: *Nippon Light Metal Co., Ltd., Tokyo, Japan,* Attorney or Agent: J. Harold Nissen, Ex. Gp.: 354

4,288,571, Re. S.N. 529,737, Filed Sept. 8, 1983, Cl. 525/170, POLYESTER COMPOSITIONS, Lowell R. Comstock, et al., Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: Joseph M. Fitzpatrick, Ex. Gp.: 142

4,310,584, Re. S.N. 521,127, Filed Aug. 8, 1983, Cl. 428/212, MULTILAYER LIGHT-REFLECTING FILM, Scott A. Cooper, et al., Owner of Record: *Mearl Corp., Ossining, N.Y.,* Attorney or Agent: Sidney G. Faber, Ex. Gp.: 164

4,321,330, Re. S.N. 514,525, Filed July 18, 1983, Cl. 435/301, TISSUE CULTURE DEVICE, Fraser L. Baker, et al., Owner of Record: *Inventors,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 172

4,323,312, Re. S.N. 492,832, Filed May 9, 1983, Cl. 366/102, FLUIDIZED BED APPARATUS, Werner Glatt, Owner of Record: *Inventor,* Attorney or Agent: Martin Fleit, Ex. Gp.: 242

4,357,382, Re. S.N. 518,452, Filed July 29, 1983, Cl. 428/212, COATED CEMENTED CARBIDE BODIES, John B. Lambert, et al., Owner of Record: *Fansteel, Inc., North Chicago, Ill.,* Attorney or Agent: Arthur Raisch, et al., Ex. Gp.: 164

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,750,257, Reexam. No. 90/000,438, Requested: Aug. 29, 1983, Cl. 29/813, SYSTEMATIZED APPARATUS FOR DRIVING FASTENERS, Imre Berecz, Owner of

Record: *Kaynar Manufacturing Co., Inc., Fullerton, Calif.*, Attorney or Agent: Maurice J. Beck, Ex. Gp.: 326, Requester: Frank A. Klaus, Brea, Calif.

4,265,533, Reexam. No. 90/000,444, Requested: Sept. 15, 1983, Cl. 355/110, APPARATUS FOR THE PRODUCTION OF DUPLICATE AND OTHER FILMS FROM ORIGINAL FILMS, Robert W. Gasse, Owner of Record: *Inventor,* Attorney or Agent: John Remon Wenzel, Ex. Gp.: 211, Requester: John Remon Wenzel, Arlington, Va.

Patent Terms Extended Under 35 U.S.C. 155

Certificates extending the terms with respect to the following patents were issued under the provisions of 35 U.S.C. 155 on Sept. 16, 1983.

Patent No. 3,492,131, granted Jan. 27, 1970, to James M. Schlatter, owner of record G. D. Searle & Co. Term extended 5 years, 10 months and 17 days.

Patent No. 3,780,189, granted Dec. 18, 1973, to Don Scott, owner of record G. D. Searle & Co. Term extended 5 years 10 months and 17 days.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 11, 1983

D. 265,431	4,366,838	4,386,259	4,392,880
4,176,294	4,367,387	4,386,297	4,393,363
4,230,839	4,368,352	4,386,358	4,393,444
4,247,987	4,370,615	4,386,404	4,393,540
4,271,481	4,372,167	4,387,622	4,393,563
4,293,214	4,374,832	4,388,372	4,394,286
4,300,439	4,375,369	4,388,428	4,394,374
4,302,785	4,376,251	4,388,710	4,394,401
4,330,327	4,377,407	4,389,199	4,395,014
4,336,245	4,377,576	4,389,322	4,395,081
4,339,811	4,377,602	4,389,330	4,395,100
4,339,889	4,378,118	4,389,373	4,395,101
4,343,882	4,378,512	4,389,480	4,395,392
4,347,235	4,378,657	4,390,284	4,395,606
4,350,600	4,380,018	4,390,483	4,396,737
4,350,614	4,380,180	4,390,632	4,396,789
4,351,926	4,380,237	4,390,714	4,396,958
4,355,089	4,380,253	4,390,778	4,397,183
4,355,441	4,380,728	4,390,889	4,397,509
4,355,848	4,381,383	4,391,115	4,397,658
4,356,975	4,382,019	4,391,194	4,397,793
4,358,580	4,383,246	4,391,638	4,398,155
4,358,714	4,383,610	4,391,855	4,399,433
4,361,045	4,384,530	4,392,111	
4,361,875	4,384,887	4,392,207	
4,366,579	4,384,959	4,392,461	

Disclaimers

3,291,947.—*Roswell C. van Sickle,* Wilkinsburg, Pa. INTERRUPTING STRUCTURES FOR COMPRESSED-GAS CIRCUIT INTERRUPTERS HAVING DOUBLE-BREAK HOLLOW ROTATIVE MOVING CONTACT-ARM ASSEMBLY. Patent dated Dec. 13, 1966. Disclaimer filed Mar. 26, 1979, by the assignee, *Westinghouse Electric Corp.*

Hereby enters this disclaimer to claims 8, 11 and 12 of said patent.

3,301,159.—*Ira B. Current,* Binghamton, N.Y. PROCESSING DEVICE FOR MOTION PICTURE FILMS. Patent dated Jan 31, 1967. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,486,495.—*Holless W. Allen,* Kansas City, Mo. ARCHERY BOW WITH DRAW FORCE MULTIPLYING ATTACHMENTS. Patent dated Dec. 30, 1969. Disclaimer filed June 3, 1983, by the assignee, *Allen Archery, Inc.*

Hereby enters this disclaimer to claims 3, 4, 5, 6, 12 and 13 of said patent.

3,593,209.—*Norman C. Gittinger,* Schenectady, N.Y. HYBRID FILTER FOR TWO-WAY TRANSMISSION OVER A SINGLE LINE. Patent dated July 13, 1971. Disclaimer filed May 11, 1983, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,613,797.—*Carroll J. Whitfield* and *Jack C. Whitesides,* Columbus, Ga. PEANUT DIGGER, SHAKER AND INVERTER. Patent dated Oct. 19, 1971. Disclaimer filed Dec. 5, 1980, by the assignee, *Kelley Manufacturing Co.*

Hereby enters this disclaimer to claims 3, 4, 5, 6, 8, 9 and 10 of said patent.

3,802,607.—*Keith C. Mead,* Midland, Mich. CHILD RESISTANT OVERCAP FOR AEROSOL OR LIKE CONTAINERS. Patent dated Apr. 9, 1974. Disclaimer filed June 4, 1979, by the assignee, *The Dow Chemical Co.*

Hereby enters this disclaimer to claim 3 of said patent.

4,003,865.—*Milton Nowak,* South Orange and *William Singer,* Teaneck, N.J. ENZYME INHIBITORS, USES AND COMPOSITIONS CONTAINING SAME. Patent dated Jan. 18, 1977. Disclaimer filed July 6, 1982, by the assignee, *Troy Chemical Corp., Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16 and 17 of said patent.

4,189,718.—*William H. Carson; Gerald D. Smith* and *Frank R. Owens,* Indianapolis, Ind. ELECTRONIC SIREN. Patent dated Feb. 19, 1980. Disclaimer filed July 18, 1983, by the assignee, *Carson Manufacturing Co., Inc.*

Hereby enters this disclaimer to claims 21 to 29 of said patent.

4,340,538.—*Kenneth P. Shepard,* Portage, Mich. PROCESS FOR PRODUCING 6 ALPHA-FLUORO-DELTA 1, 4-3-KETO STEROIDS. Patent dated July 20, 1982. Disclaimer filed June 8, 1983, by the assignee, *The Upjohn Co.*

Hereby enters this disclaimer to claim 29 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
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	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

OCTOBER 11, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,266,236 (127th)
TRANSISTOR HAVING EMITTER RESISTORS FOR STABILIZATION AT HIGH POWER OPERATION
Kazuyoshi Ueda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan
Reexamination Request No. 90/000,285, Nov. 8, 1982.
Reexamination Certificate for Patent No. 4,266,236, issued May 5, 1981, Ser. No. 32,821, Apr. 24, 1979.
Claims priority, application Japan, Apr. 24, 1978, 53-48950
Int. Cl.³ H01L *29/72*
U.S. Cl. 357—34

AS A RESULT OF REEXAMINATION, IT AS BEEN DETERMINED THAT:

Claims 1–5 having been finally determined to be unpatentable, are cancelled.

[1. A semiconductor device comprising a collector region of one conductivity type, a base region of the other conductivity type making contact with said collector region, an emitter region of said one conductivity type making contact with said base region and separated from said collector region, an additional region of said other conductivity type having its pheriphery surrounded by said emitter region, an emitter electrode electrically connected to said additional region, and at least one additional electrode separated from said emitter electrode and electrically short-circuiting said emitter region and said additional region.]

B1 4,287,216 (128th)
CHOCOLATE CONFECTION CONTAINING CARBONATED HARD CANDY CRYSTALS DISPERSED THEREIN
Santi F. Mangano, Perugia, Italy, assignor to I.B.P. Industrie Buitoni Perugina S.p.A., Perugia, Italy
Reexamination Request No. 90/000,183, Apr. 1, 1982.
Reexamination Certificate for Patent No. 4,287,216, issued Sep. 1, 1981, Ser. No. 108,703, Dec. 31, 1979.
Claims priority, application Italy, Nov. 16, 1979, 50844 A/79
Int. Cl.³ A23G *3/00*
U.S. Cl. 426—96

AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

Claims 1–7 having been finally determined to be unpatentable, are cancelled.

[1. A confectionery product, which comprises at least two components, the first component being chocolate, and the second component being a certain number of popping candied crystals, said chocolate and said popping candied crystals having a moisture content between about 0.1 and about 5.0%, said crystals being sugar crystals such as saccharose, glucose. lactose, maltose, and fructose, and containing a gas such as carbon dioxide, hydrogen, air or inert gas, at a pressure of about 1 to about 80 atmospheres and in a quantity between about 0.1 and about 1% in weight, the ratio between the first and second component being between 10:1 and 1:10 by weight.]

B1 4,215,431 (129th)
WIRELESS TRANSMISSION SYSTEM
John Nady, 1250 Rose St., Berkeley, Calif. 94702
Reexamination Request No. 90/000,228, Jul. 20, 1982.
Reexamination Certificate for Patent No. 4,215,431, issued Jul. 29, 1980, Ser. No. 950,574, Oct. 12, 1978.
Continuation-in-part of Ser. No. 842,152, Oct. 14, 1977, abandoned.
Int. Cl.³ H04B *1/62*
U.S. Cl. 455—43

AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

Claims 1–8 having been finally determined to be unpatentable, are cancelled.

[1. A wireless, portable, self-contained transmission system for use with at least one of microphone transducers and musical instrument transducers receiving an audio input and providing a transduced audio signal, said transmission system comprising a portable, battery powered, self-contained transmitter means for transmitting compressed signals to a remote receiver means, said transmitter means including noise reduction compression means responsive only to the transduced audio signal for compressing the transduced audio signal and providing a compressed output signal to a transmission means for transmission to said remote receiver means, said remote receiver means receiving the transmitted compressed signals and supplying a compressed transduced audio signal to noise reduction expansion means corresponding to said noise reduction compression means of said transmitter means, said noise reduction expansion means expanding the transmitted compressed signals for providing an audio output signal with an improved signal to noise ratio to a utilization means whereby substantially noise-free transmission is effected, said noise reduction compression means including amplifier means responsive to the transduced audio signal, variable gain means connected in a feedback path of said amplifier means, said variable gain means having the gain thereof controlled by average value detector means, wherein said average value detector means being driven by an output from a preemphasis means receiving an output of said amplifier means.]

REISSUES

OCTOBER 11, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,408

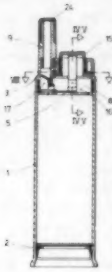
DISPENSER FOR PASTE-LIKE PRODUCTS WITH A MANUALLY ACTUATABLE PISTON

Joachim Czech, Jahnstrasse 19, D-8405 Donaustauf, and Hans D. Sieghart, Moosburg, both of Fed. Rep. of Germany, assignors to Joachim Czech, Donaustauf, Fed. Rep. of Germany

Original No. 4,301,948, dated Nov. 24, 1981, Ser. No. 102,893, Dec. 12, 1979. Application for reissue Feb. 1, 1982, Ser. No. 344,695

Int. Cl.³ B67D *5/42*

U.S. Cl. 222—341 16 Claims



1. A dispenser for paste-like products comprising a container having opposite ends which are spaced apart in a longitudinal direction and one of which is substantially closed by a wall wherein there is a hole, a head member on said one end of the container having a portion that is manually inwardly displaceable against a bias, said head member cooperating with said wall to define a pump chamber into which product can flow from the container through said hole and which has an outlet spaced from said hole, a slidable piston sealingly engaging the inner surface of the container to close its other end, and a pair of check valve elements, one arranged to prevent flow of product through said hole from the pump chamber into the container and the other arranged to prevent inward flow through said outlet towards the pump chamber, said dispenser being characterized by:

A. said outlet being defined by a portion of said head member that is formed as a duct which is in laterally spaced relation to said hole and extends away from said wall in said longitudinal direction; and

B. said dispenser further comprising an insert member of resilient material confined in said head member and having

(1) a first flap portion which provides said one check valve element and which normally flatwise overlies said wall to close said hole therein but is flatwise flexible away from said wall,

(2) a second flap portion providing said other check valve element, said second flap portion being spaced from said wall and normally extending across said duct to prevent inward flow therethrough but being resiliently flatwise flexible away from said wall, and

(3) a medial portion to which said flap portions have flexing connections for flatwise movement, said connections being substantially parallel to one another, spaced apart in said longitudinal direction, and substantially contained in a plane that extends in said longitudinal direction, and said medial portion being formed to define a channel between said connections which extends transversely through said plane and through which product flows in passing from said hole to the space between said wall and said second-flap portion.

Re. 31,409

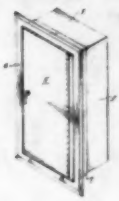
UNIVERSAL RECESSED WALL CABINET

Norman B. Crist, 12927 NE. 151st, Kirkland, Wash. 98033

Original No. 4,076,350, dated Feb. 28, 1978, Ser. No. 644,431, Dec. 29, 1975. Application for reissue Feb. 25, 1980, Ser. No. 124,336

Int. Cl.³ A47B *67/00*; A47F *5/08*; G12B *9/00*

U.S. Cl. 312—242 2 Claims



2. A device for installation in a wall structure recess comprising:

a case having a substantially rectangular cross section of substantially constant area from front to back of said case, the outer periphery of said case being formed by flat sidewalls including top, bottom and sides for blocking access between the interior of said case and the wall recess, and said case top, bottom and sides having forward coplanar edges defining a planar front opening;

a rectangular mounting frame separate from said case, including four border members arranged orthoginally, each border member being of angle cross section forming an outer flange portion and an inner flange portion, said inner flange portions of said four border members being parallel to and snugly encircling said case sidewalls and said outer flange portions of said four border members projecting outward from said border member inner flange portions transversely thereof and away from the case sidewalls respectively adjacent thereto for engagement with the outer face of the wall structure encircling the recess, said inner flange portion of each border member being substantially narrower than the width of said case sidewalls and projecting from the outer flange portion joined thereto away from said case frame opening for insertion into the wall structure recess, and said mounting frame and case being fitted for relative sliding for adjustment of said mounting frame toward and away from said case front opening between a position of said mounting frame in which its outer flange portions are closer than the width of said frame inner flange portions to the case front opening, a position of said mounting frame in which its outer flange portions are substantially even with the case front opening when the case front opening is substantially flush with the outer margin of the wall recess, and positions of said mounting frame in which its outer flange portions are farther than the width of said frame inner flange portions from the case front opening with said mounting frame border member outer flange portions in engagement with the outer margin of the wall structure recess when said inner flange portions project rearward into the wall structure recess and when said case is installed in such recess with its sidewalls extending inwardly beyond the inner edges of said mounting frame border member inner flange portions; and

headed securing pins of a length much greater than the combined thicknesses of said case sidewalls and said mounting frame border member inner flange portions for extending from inside said case through said case sidewalls and through said mounting frame border member inner flange portions and penetrating into the wall structure forming the recess for forcing walls of said case and adjacent inner flange portions of mounting frame border members conjointly to-

ward the wall structure within the wall structure recess whereby said case and said mounting frame are positively secured conjointly in the wall structure recess by said securing pins.

Re. 31,410

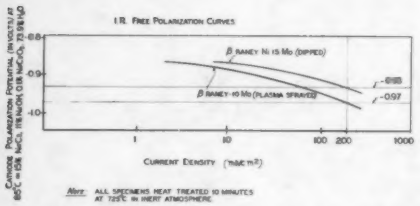
RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Original No. 4,240,895, dated Dec. 23, 1980, Ser. No. 25,153, Mar. 29, 1979. Application for reissue Oct. 7, 1981, Ser. No. 309,358

Int. Cl.³ C25B *11/06*

U.S. Cl. 204—290 R **3 Claims**



1. An improved low overvoltage electrode for use as a hydrogen evolution cathode in an electrolytic cell, the electrode being of the type that has a Raney metal surface layer in electrical contact with a conductive metal core, wherein the improvement comprises: said Raney metal surface layer is predominantly derived from *an* adherent *predominantly beta phase* $Ni_xMo_{1-x}Al_3$ crystalline precursory surface layer structure, where x is no more than 0.95.

Re. 31,411

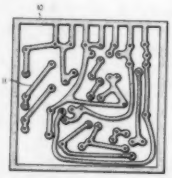
RADIATION CURABLE INKS

Donald A. Bolon, Scotia; Gary M. Lucas, Schenectady, both of N.Y., and Ralph L. Bartholomew, Painesville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Original No. 3,968,056, dated Jul. 6, 1976, Ser. No. 509,822, Sep. 27, 1974. Application for reissue Jun. 7, 1978, Ser. No. 913,433

Int. Cl.³ H01C *13/00*

U.S. Cl. 252—501.1 **17 Claims**



16. A screen printable radiation curable ink convertible to an abrasion resistant conductive coating exhibiting a specific resistivity of less than 10 ohm-cm when cured into a non-tacky condition by ultraviolet radiation on a thermoplastic substrate, said ink consisting essentially of by weight

A. from about 10 to 60 percent of a radiation curable organic resin binder having a viscosity of from about 50 to 10,000 centipoises at 25° C., and

B. from about 90 to 40 percent of an electrically conductive filler consisting essentially of a particulated electrically conductive material selected from the group consisting of a particulated electrically conductive metal and a particulated electrically conductive metal containing material, including mixtures thereof, with no more than about 15% by weight of said particulated electrically conductive material having an aspect ratio of diameter to thickness of a value greater than 20.

Re. 31,412

PRESSURE-AND-HEAT-SENSITIVE COPYING PAPER

Yoshihiro Hatano, Oosaka, and Kenji Yamamoto, Yao, both of Japan, assignors to Yamamoto Kagaku Gosei Kabushiki Kaisha, Osaka, Japan

Original No. 3,920,510, dated Nov. 18, 1975, Ser. No. 384,304, Jul. 31, 1973. Application for reissue May 27, 1980, Ser. No. 153,660

Claims priority, application Japan, Aug. 1, 1972, 47-77081

Int. Cl.³ B32B *29/00;* **B41C** *1/06;* **B41M** *5/16, 5/18*

U.S. Cl. 428—537 **3 Claims**

20. A heat or pressure sensitive copying paper containing a fluoran compound as a color former, said color being developed in said heat or pressure sensitive copying paper through the application of heat or pressure, said fluoran compound being selected from the group consisting of 2-m-chloroanilino-6-diethylaminofluoran; 2-o-chloroanilino-6-diethylaminofluoran; 2-(3',5'-dichloroanilino)-6-diethylaminofluoran; 2-(3',4'-dichloroanilino)-6-diethylaminofluoran; 2-p-chloroanilino-3-methyl-6-diethylaminofluoran; 2-m-chloroanilino-3-methyl-6-diethylaminofluoran; 2-o-chloroanilino-3-methyl-6-diethylaminofluoran; 2-p-bromoanilino-3-methyl-6-diethylaminofluoran; 2-(4'-chloro-3'-methylanilino)-3-methyl-6-diethylaminofluoran; 2-(3',5'-dichloroanilino)-3-methyl-6-diethylaminofluoran; 2-(3',4'-dichloroanilino)-3-methyl-6-diethylaminofluoran; 2-(2',5'-dichloroanilino)-6-diethylaminofluoran; 2-(4'-chloro-N-methylanilino)-6-diethylaminofluoran; 2-(4'-chloro-N-ethylanilino)-6-diethylaminofluoran and 2-(4'-chloro-3'-methylanilino)3-methyl-6-dimethylaminofluoran.

Re. 31,413

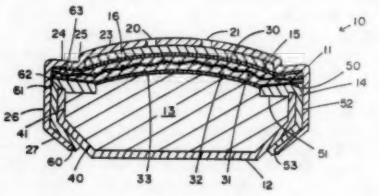
GAS DEPOLARIZED ELECTROCHEMICAL CELLS AND METHOD OF ASSEMBLY

Arthur M. Jaggard, Chilicothe, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Original No. 3,897,265, dated Jul. 29, 1975, Ser. No. 437,924, Jan. 30, 1974. Application for reissue Feb. 22, 1980, Ser. No. 123,600

Int. Cl.³ H01M *2/00*

U.S. Cl. 429—27 **58 Claims**



25. A sealed and sized gas depolarized electrochemical cell comprising:

a first metal housing having a closed end and an open end, said closed end having an opening therein to allow gas to enter said first metal housing, said closed end of said first metal housing forming a first external electrical contact for said gas depolarized electrochemical cell, said first metal housing having means for fastening said first metal housing to a second metal housing;

a second metal housing having a closed end and an open end, said second metal housing having a region therein for receiving an anode material, said closed end of said second metal housing forming a second external electrical contact for said gas depolarized electrochemical cell; said second metal housing having means for fastening to said first metal housing;

a cathode assembly including an electrically conductive current

collecting member, said current collecting member forming electrical contact with said first metal housing; a hydrophobic layer on one side of said cathode assembly and a separator on the opposite side of said cathode assembly;

a single insulating and sealing member having an L-shaped cross section shape, said insulating and sealing member having a first surface for forming sealing contact with said first metal housing, said insulating and sealing member having a second surface for forming sealing contact with said second metal housing; said insulating member having a third surface for abutting against and extending partially along said cathode assembly to thereby firmly hold said cathode assembly against said metal housing; anode material located in said second metal housing to form electrical contact with said second metal housing, said anode material located adjacent said separator; and an electrolyte in said gas depolarized electrochemical cell so that said second metal housing, said first metal housing, and said insulating and sealing member coact to simultaneously seal and maintain said first metal housing and said second metal housing in a leakproof electrolyte seal; and said first metal housing is further characterized by the closed end thereof consisting of an annular flat outer portion and a continuous, arcuate convexo-concave crown center portion with the concave side of said crown center portion facing in the direction of said cathode assembly.

Re. 31,414

ELECTROLYTE SALTS FOR NON AQUEOUS ELECTROCHEMICAL CELLS

Arabinda N. Dey, Needham; John S. Miller, Charlestown, both of Mass., and William L. Bowden, Nashua, N.H., assignors to Duracell Inc., Bethel, Conn.

Original No. 4,177,329, dated Dec. 4, 1979, Ser. No. 956,833, Nov. 2, 1978. Application for reissue Oct. 21, 1980, Ser. No. 199,160

Int. Cl.³ H01M *10/36*

U.S. Cl. 429—101 **9 Claims**

10. A non-aqueous electrochemical cell comprising a lithium anode, a fluid cathode depolarizer and an electrolyte salt dissolved in said fluid cathode depolarizer characterized in that said electrolyte salt consists of $LiGaCl_4$.

Re. 31,415

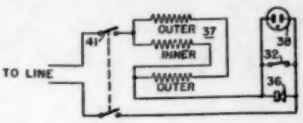
CONVENIENCE FOOD TOASTER OPERABLE AT DIFFERENT WATTAGE LEVELS

David B. Price, Mansfield, Ohio, and Wathena L. Shine, Royal Oaks, Pa., assignors to Scovill Inc., Waterbury, Conn.

Original No. 3,585,363, dated Jun. 15, 1971, Ser. No. 814,722, Apr. 9, 1969. Application for reissue May 29, 1974, Ser. No. 473,991

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—494 **6 Claims**



6. In an automatic toaster having a circuit including a heater means operatively connected to a source of power through a timing means to establish a heating cycle of operation, said timing means including a heat responsive means to initiate termination of said cycle upon reaching a predetermined heated condition, and means for varying the duration of the cycle over a predetermined range with said heater means energized at a relatively constant wattage level throughout said range and wherein the improvement comprises:

manually actuable switch means in said circuit movable between opened and closed positions;

means operatively connected to said heater means by placing said switch means in one of said positions for reducing the wattage of said heater to a relatively constant predetermined lower level, said heater means operatively connected through said timing means when said switch means is in said reduced wattage position, whereby a greater length of time is required to heat said heat responsive means to said predetermined termination condition thus extending the cycle of operation of said toaster at reduced wattage; and

a manually movable actuator associated with said switch means, said actuator having an abutment surface movable from a noninterfering position to a position interfering with said duration varying means when said actuator is moved from said switch closed to said switch open position.

PLANT PATENTS

GRANTED OCTOBER 11, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,117
ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Jan. 29, 1982, Ser. No. 344,031
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers variegated or striped (in differing degrees and patterns) with pink and white, the bud being pointed in the early opening stage, resembling in form Beauty Secret (miniature — not patented), with the open flower being rounded and full with many (35 or more) petals; and further characterized by a plant of compact, vigorous, well rounded shape; with main stems and shoots of less than average thorniness, the said plant being easy to propagate from softwood cuttings, with an abundance of small semi-glossy to matt foliage, the flowers being born singly or several to the stem in clusters.

5,118
ROSE PLANT JACMAT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 1, 1982, Ser. No. 353,022
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its compact habit of growth, stiff flowers of orange-red.

5,119
ROSE PLANT 71-1172

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 1, 1982, Ser. No. 353,522
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its upright, branched, stiff plant bearing large yellow-orange blooms, of little fragrance, and having glossy foliage.

5,120
ROSE PLANT 72-12551

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 1, 1982, Ser. No. 353,523
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its upright plant, orange-red flowers of little fragrance and excellent form and substance and numerous small prickles on the canes.

PATENTS

GRANTED OCT. 11, 1983

ERRATA

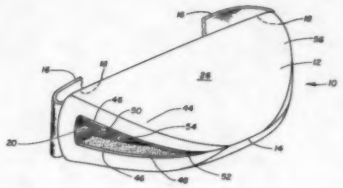
For CLASS	See PATENT NO.
150–023	4,408,618
383–070	4,408,643
420–584	4,409,025
419–010	4,409,029
106–020	4,409,039
106–020	4,409,040
525–280	4,409,120
502–020	4,409,122
502–038	4,409,123
502–022	4,409,124
502–180	4,409,125
502–169	4,409,126
502–205	4,409,127
502–211	4,409,128
502–185	4,409,129
502–221	4,409,130
502–263	4,409,131
502–062	4,409,132
502–354	4,409,133
564–438	4,409,386
381–071	4,409,435
381–015	4,409,436

PATENTS

GRANTED OCTOBER 11, 1983

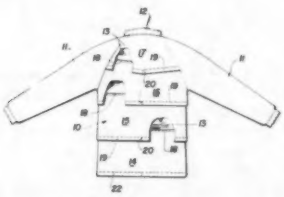
GENERAL AND MECHANICAL

4,408,355
HAND WARMER
Kenneth Brock, R.R. #2, Albion, Ind. 46701
Filed Nov. 19, 1982, Ser. No. 443,061
Int. Cl.³ D04B *7/04*
U.S. Cl. 2—66 **6 Claims**



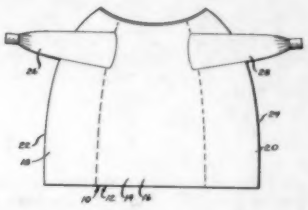
1. A hand warming device for cold environments, comprising:
a muff having end openings and being made of a plurality of layers of material, the outer layer thereof being a water repellent material, and an inner layer thereof being an insulating material,
an elastic band member disposed in the interior of said muff and adapted to removably hold therein a heat source for warming the hands of the user,
closing means at each said end opening for selectively varying the size thereof between fully open and fully closed, and
an adjustable belt attached to said muff to secure said muff against a body portion of the user.

4,408,356
VENTILATED RAIN GARMENT
Simon Abrams, 100 Taft St., Hazleton, Pa. 18201
Filed Dec. 14, 1981, Ser. No. 330,173
Int. Cl.³ A41D *3/04*
U.S. Cl. 2—87 **1 Claim**



1. A ventilated rain garment including a body portion, the body portion comprising a lightweight foraminous textile lining, an outer shell for the body portion comprising a plurality of relatively wide parallel horizontal sections of moisture-impermeable flexible sheet material disposed in shingled relationship on the exterior of the lining, said shingled sections being attached to the lining adjacent to the top edges of the sections by continuous horizontal lines of stitching through the sections and lining, the bottom horizontal edges of the shingled sections being substantially freely disposed one relative to another and relative to the lining, short tacking stitches at the rear center of the body portion only attaching the lower free edge portion of each shingled section to the top portion of the adjacent underlying shingled section therebeneath, whereby the shingled sections cannot be elevated at the rear of the garment by the force of wind or the like, and the lower edges of the shingled sections being folded inwardly and upwardly to produce concealed hems extending horizontally on the body portion and being secured by additional continuous horizontal lines of stitching.

4,408,357
DISPOSABLE GARMENT
Michael R. Toth, Andover, Mass., assignor to The Kendall Company, Boston, Mass.
Filed Feb. 1, 1982, Ser. No. 344,428
Int. Cl.³ A41B *9/00*
U.S. Cl. 2—114 **22 Claims**



1. A disposable garment comprising, a gown having a front panel, a pair of back panels extending from opposed sides of the front panel, and a pair of sleeves, said sleeves being constructed of a water repellent material having nonentangled fibers, and said back panels being constructed of a porous material having entangled fibers.

4,408,358
COLD-WEATHER SPORTS GLOVE
Richard L. Swan, 1260 Monroe St., Reno, Nev. 89509
Filed Aug. 16, 1982, Ser. No. 408,695
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 A **21 Claims**

1. A cold weather glove comprising:
a tubular hand portion;
a tubular wrist portion extending from said hand portion;
thumb, index finger, middle finger, ring finger and pinky tubular portions extending from said hand portion,
said middle finger, ring finger and pinky tubular portions being closed at their distal ends,
said thumb and index finger tubular portions being shortened and being open at their distal ends to expose the wearer's thumb and index fingers; and
first and second sealing means, coupled to each of said thumb and index finger portions adjacent said distal ends, for sealing said thumb and index finger portions to the wearer's thumb and index finger to limit cold air or water

intrusion into the glove at said open distal ends of said thumb and index finger tubular portions.

4,408,359

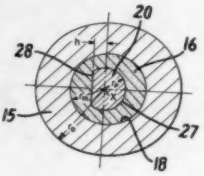
HIP JOINT PROSTHESIS

Albert H. Burstein, Greenwich, Conn., and Donald L. Bartel, Freeville, N.Y., assignors to New York Society for the Relief of the Ruptured and Crippled, Maintaining the Hospital for Special Surgery, New York, N.Y.

Filed Apr. 7, 1981, Ser. No. 251,883

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.912 **6 Claims**



1. In a femoral component for a hip joint prosthesis adapted to be implanted in a femur and including a ball adapted to replace the head of the femur and a stem adapted to be received in the medullary cavity of the femur and to be affixed therein by a cement, said stem having a proximal portion, an intermediate portion and a distal portion, the improvements wherein each transverse cross section along the intermediate portion of the stem that is subject to the greatest stress is bounded by a generally circular surface of a radius r_p throughout the major portion of the periphery and wherein said circular surface is truncated to provide a flat surface on the lateral side of the stem, as viewed in the lateral-medial plane, thus providing an increased cross-sectional dimension when the stem alone carries the load and affording location of the neutral axis of bending proximate the lateral flat surface in the intact composite structure of stem, cement and bone, wherein the lateral flat surface is spaced apart from the geometric center of the circular surface by a distance h, h being such that

$$0.3 \leqq h/r_p \leqq 0.7,$$

so that the maximum stress within said intermediate portion is less than the fatigue strength of the material of the stem, and wherein the stem is adapted to be received in the medullary cavity such that the flat surface is in close proximity to the neutral axis of bending of the composite bone-cement-prosthesis where tensile stresses due to bending movements are small so that the bone at the lateral side carries a substantial part of the tensile stress of the composite structure and hence bone resorption is inhibited.

4,408,360

VARIO-HEAD ENDOPROSTHESIS

Arnold Keller, Kalhude, Fed. Rep. of Germany, assignor to Waldemar Link GmbH & Co., Hamburg, Fed. Rep. of Germany

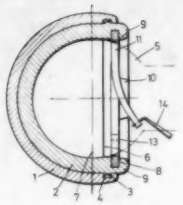
Filed Oct. 8, 1981, Ser. No. 309,722

Claims priority, application European Pat. Off., Nov. 6, 1980, 80106835.4

Int. Cl.³ A61F *1/24*

U.S. Cl. 3—1.913 **6 Claims**

1. A vario-head endoprosthesis comprising a ball-shaft prosthesis, for example a femur prosthesis, and a vario-head prosthesis having an outer shell and an inner insert which provides a socket for the prosthesis ball having an aperture forming a constriction providing a positive safeguard against removal of the prosthesis ball from the socket, characterized in that the insert has a collar with an inwardly facing annular groove (8) surrounding and opening into the aperture region of the socket (1,2), and the constriction is formed by a split ring (11) mounted within the annular groove and retained therein against expansion to engage and positively retain the prosthesis ball within the socket, the split ring being flexible so as to be



adapted to be inserted circumferentially into the annular groove (8) and the opening side of the socket collar having cut-out means (10) to enable the split ring (11) to be inserted into or withdrawn from the annular groove in the circumferential direction.

4,408,361

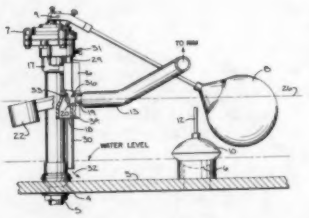
DIVERTER VALVE

Roy J. Rozek, Plymouth, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jul. 6, 1982, Ser. No. 395,790

Int. Cl.³ E03D *1/24, 1/30*

U.S. Cl. 4—331 **5 Claims**



1. In a water closet of the type in which there is a bowl, a storage tank, an inlet in the tank for connection to a supply of water, an outlet leading from the tank to the bowl, an inlet valve which controls the flow of water to the tank in response to changes in the water level of the tank, a flush valve controlling the discharge of water through the outlet to the bowl, the flush valve being manually operable so as to initiate a flushing cycle of the water closet and automatically closing in response to the emptying of the storage tank, and a diversion conduit for directing water from the inlet directly to the bowl, the improvement comprising:

a diverter valve having a housing with an inlet passage for receiving a supply of water from the inlet valve, a first outlet passage communicating with said inlet passage for delivering water exiting from the diverter valve to the storage tank, and a second outlet passage communicating with said inlet passage for delivering water exiting from the diverter valve to the diversion conduit;

a flap mounted in a diverter valve passage for proportioning the flow of water between the two outlet passages;

water level sensing means connected to the flap to activate the flap in response to changes in the water level of the tank;

said flap being positioned by the water level sensing means to direct water to the first outlet passage when the flush cycle of the water closet is first initiated;

said flap being positioned by the water level sensing means to direct water to the second outlet passage when the water level in the storage tank has dropped below a predetermined diversion level;

said water level sensing means acting to allow continued flow to the second outlet passage after the flush valve has closed in response to the emptying of the tank; and

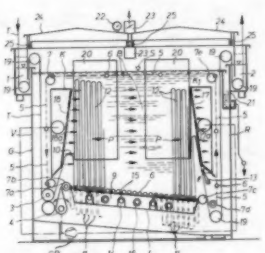
bleed means in communication with the water supply for allowing a portion of the water supply to flow into the storage tank when the water level is below the diversion level so as to raise the water level above the diversion level.

4,408,362

METHOD FOR CONTINUOUSLY TREATING STRAND-LIKE TEXTILE MATERIAL IN VERTICAL LOOPS

Wolfgang Tschirner, Tönisvorst, Fed. Rep. of Germany, assignor to Kleinewefers, Jaeggli AG, Rümikon, Switzerland

Division of Ser. No. 198,051, Oct. 17, 1980, Pat. No. 4,370,872.
This application Jul. 2, 1982, Ser. No. 394,705
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941900
Int. Cl.³ D06B *3/28*
U.S. Cl. 8—151 **4 Claims**



1. A method of continuously treating strand-like textile material in a container of treatment liquid, said method including the steps of:

passing said textile material through said treatment liquid;

generating vertical flow in said container to form vertical loops in said textile material;

transporting said looped textile material substantially horizontally through said treatment liquid with transverse bars;

respectively arranging said bars in the lower bends of said loops in the vicinity of the bottom of said container;

utilizing said transverse bars to effect said loop formation and to maintain the formed loops and their form stability;

moving said transverse bars from the textile strand inlet side to the textile strand outlet side of said container;

directing said vertical flow upwardly between said transverse bars; and

generating horizontal transverse flow of said treatment liquid to aid said horizontal transport of said looped textile material.

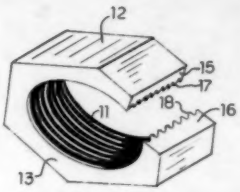
4,408,363

THREAD CONDITIONING DEVICE

Donald A. Doree, 1768 Blair St., Saint Paul, Minn. 55104

Filed Apr. 20, 1981, Ser. No. 255,458
Int. Cl.³ B23G *1/26, 5/10, 9/00*
U.S. Cl. 10—1 B **16 Claims**

1. A device for rotational movement about a threaded bolt to condition the threads of the bolt, said device comprising a unitary body essentially having an opened, generally C-shaped cross section to its axis of rotation, said unitary body having an interior threaded surface to engage the threads of the bolt to be conditioned, an exterior surface for direct mechanical engagement to grasp, squeeze and rotate said device, two generally C-shaped end surfaces, and two opposing lateral surfaces which extend between said end surfaces from said interior surface to said exterior surface, one each said opposing lateral surface essentially having an acute angular disposition being in a range of 70 degrees to 90 degrees as measured tangentially from said interior surface to said exterior surface of said C-shaped body, said body further having two spacially opposing plowing edges at the intersections of said interior surface and said two opposing lateral surfaces, said C-shaped body essentially being of a deformable and resilient construction to allow



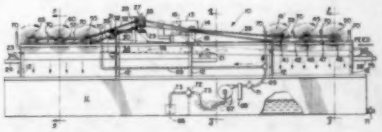
said opposing plowing edges to be moved in closer spacial proximity to each other by the application of squeezing mechanical forces to said exterior surface of said device C-shaped body, whereby, the rotational movement of said device about a threaded bolt allows said plowing edges to condition the threads of the bolt, allows resultant debris to egress thru the opened portion of said C-shaped body between said opposing lateral surfaces, and allows the user of said device to directly control plowing action forces effective at said plowing edges by predetermined squeezing mechanical engagement to said exterior surface of said C-shaped body of said device due to the deformable and resilient construction thereof as said device is rotated onto and from the threads of a bolt to be conditioned.

4,408,364

APPARATUS FOR WASHING AN ALOE VERA LEAF

Donnie Thompson, Rte. #2 Combes Rio Hondo Rd., Harlingen, Tex. 78550

Filed Mar. 19, 1982, Ser. No. 359,942
Int. Cl.³ B08B *11/00, 1/02*
U.S. Cl. 15—21 D **4 Claims**



1. An apparatus for cleaning both sides of an aloe vera leaf comprising a pair of endless conveyors for supporting the leaf thereon while travelling from the entrance to the exit end of the apparatus, one of said pair of conveyors travelling in a horizontal line of travel between a horizontally disposed roller and a vertically disposed roller so as to cause said conveyor to twist in it's travel between said rollers to thereby extend in a vertical position causing said leaf to be inverted and deposited on a second endless conveyor, said leaf travelling on said pair of endless conveyors subjected to a scrubbing action by roller brushes extending over the said pair of conveyors and simultaneously applying a cleaning solution to the said leaf through suitable sprayheads mounted on said apparatus.

4,408,365

MATS

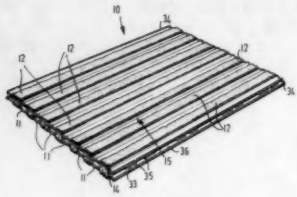
Deryk J. Palmer, Wolverhampton, England, assignor to Nuway Manufacturing Company Limited, England

Filed Dec. 4, 1981, Ser. No. 327,394

Claims priority, application United Kingdom, Dec. 6, 1980, 8039198

Int. Cl.³ A47L *23/26*

U.S. Cl. 15—112 **6 Claims**



1. A mat comprising a plurality of first strips of rigid material each of channel section comprising an upper wall and a base wall, means connecting the base wall to the upper wall, a lower wall, and means connecting the base wall to the lower wall, whereby the channel, in use, opens horizontally, a plurality of second strips of material more flexible than the first strips, interposed alternately between the first strips, a connecting element securing the first and second strips together in side by side relationship, aligned apertures in the first and second strips, the apertures in the first strips being provided in said base wall, the connecting element passing through the aligned apertures and in use, restraining the upper walls of the first strips from deforming downwardly to any substantial extent when a load is imposed on the mat, at least in the region of the connecting element.

4,408,366

CLEANING SYSTEM HAVING IMPROVED AGITATION

Aaron Goldsmith, 21821 Burbank Blvd., Woodland Hills, Calif. 91367

Continuation of Ser. No. 162,577, Jun. 24, 1980. This application Jul. 31, 1980, Ser. No. 173,974

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.³ A47L *11/00*

U.S. Cl. 15—321 **25 Claims**

17. A carpet cleaning system comprising:

means for supplying cleaning fluid;

means for supplying a vacuum;

a cleaning head for cleaning a carpet, said cleaning head including

(a) motive means for providing motive force;

(b) cleaning means for cleaning a carpet in response to the motive force from said motive means and in response to the cleaning fluid being supplied from said cleaning fluid supplying means, wherein said cleaning means includes

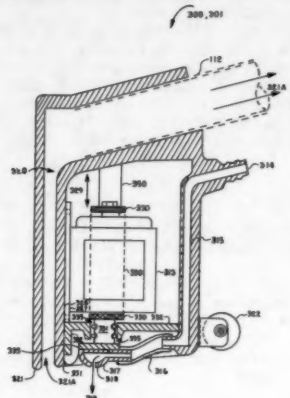
(1) means for agitating a carpet to be cleaned in response to the motive force from said motive means, said agitating means including a piston,

(2) means for agitating cleaning fluid in response to the motive force from said motive means, and

(3) means for dispensing the agitated cleaning fluid into an agitated carpet to be cleaned,

(c) recovering means for recovering cleaning fluid dispensed by said dispensing means in response to vacuum supplied by said vacuum supplying means;

(d) support means for said motive means, said cleaning means and said recovering means, and



(e) an O-ring resiliently and compliantly disposed within said support means about said piston for supporting said agitating and said dispensing means.

4,408,367

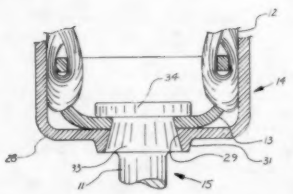
END BRUSH

Ronald J. Pusterhofer, Chesterland, Ohio, assignor to Advance Brushes, Inc., Cleveland, Ohio

Filed Apr. 20, 1981, Ser. No. 255,367

Int. Cl.³ A46B *7/08*

U.S. Cl. 15—180 **14 Claims**



8. A rotary end brush assembly comprising a stamped sheet metal cup holder, said cup holder having an open face at one end and a generally radially extending end wall at its opposite end, said cup holder including a cylindrical sidewall integral with said end wall and extending from said end wall axially forwardly to said open end, said end wall having a central aperture formed at least in part by an axially extending flange integrally formed on the end wall, bristle material anchored in said cup holder, a unitary arbor extending through said aperture and being permanently affixed to the cup holder, said arbor being a generally circular body of stepped diameter, a head section of said arbor forming its major diameter and being larger in diameter than said aperture, said head section being disposed in said cup holder adjacent said end wall, a hub section of said arbor seated in said aperture, and a cylindrical stem section of said arbor extending rearwardly of said hub section, said arbor being affixed to said cup holder by a high degree of radial interference between said hub section and said aperture as a result of free radial upsetting of said hub section in said aperture while said head and stem sections are substantially devoid of distortion.

10. A method of manufacturing an end brush comprising the steps of providing a cup-shaped metal holder having a central aperture in the end wall thereof with the aperture having an

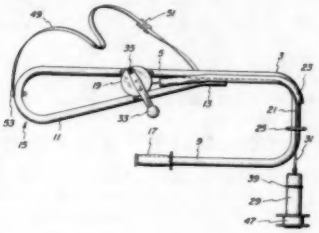
axial length substantially greater than the thickness of the sidewall, providing a metal arbor having head, hub, and stem sections, with the head section having a diameter larger than the aperture, inserting the arbor hub section into the cup holder aperture so that the stem section extends rearwardly away from said cup holder, axially compressing the head and hub sections with opposed tool elements in a manner wherein said hub section is caused to upset by plastic deformation into a diameter greater than at least a portion of said aperture to thereby permanently lock said arbor onto said cup holder, and positioning and securing bristle material in said cup holder.

4,408,368

CHIMNEY CLEANING DEVICE

Donald P. Vickery, Gloversville, N.Y., assignor to Nelson A. Taylor Co., Inc., Gloversville, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,968
Int. Cl.³ F23J *3/00*
U.S. Cl. 15—243 **11 Claims**



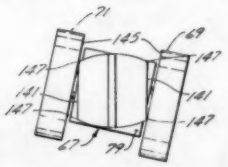
1. A chimney device for removing creosote deposits and soot from a chimney flue while the chimney is in operation, or during a chimney fire, and without said device causing damage to the chimney flue, its tile liner or chimney bottom, said device having a head for removing said creosote deposits and soot comprising an impacting weight, an upper ring and a bottom ring, an upper cutter and a lower cutter for engaging and removing creosote deposits and soot, and a spacer ring between said cutters, wherein said impacting weight carries said upper and bottom rings and said cutters and spacer ring and wherein said upper and bottom rings act as limit stops to limit movement of said cutters therebetween and to transmit ramming impact to said cutters upon up and down movements of said impacting weight.

4,408,369

MOUNTING ASSEMBLY FOR A FOLDING CLOSURE

Henri M. R. Labelle, 50 Westmooreland Ave., Cornwall, Ontario, Canada K6J 2G4

Filed Aug. 21, 1981, Ser. No. 295,230
Int. Cl.³ A47H *15/00*; E05D *13/02*
U.S. Cl. 16—102 **3 Claims**



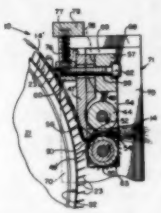
1. A mounting assembly for use in movably suspending a member from a curved track comprising: a wheel assembly, the wheel assembly comprising a mounting member with a pair of wheels rotatably mounted on the mounting member, the wheel assembly adapted to run on the curved track; means connecting the wheel assembly to the member to be suspended from the curved track, the wheel assembly rotatable relative to the connecting means about a vertical axis which is perpendicular to the axis of rotation of the wheels; and means on the connecting means for interfering directly with at least one of the wheels on the mounting member, after the wheel assembly has rotated a limited amount relative to the connecting means, to limit further rotation of the wheel assembly.

4,408,370

SHORT FIBER FEED SYSTEM FOR SLIVER HIGH PILE FABRIC KNITTING MACHINES

Earl R. Quay, Orangeburg, S.C., assignor to Mayer, Rothkopf Industries, Inc., Orangeburg, S.C.

Continuation-in-part of Ser. No. 338,251, Jan. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 295,731, Aug. 24, 1981. This application May 21, 1982, Ser. No. 380,532
Int. Cl.³ D01G *15/40, 15/84*; D04B *9/12*
U.S. Cl. 19—105 **11 Claims**



1. In a feeding system for feeding relatively short fibers to a sliver high pile fabric knitting machine, said feeding system including a pair of rotatable feed rolls, a feed plate disposed in close proximity to the peripheries of the feed rolls and a rotatable doffer for delivering fibers to the needles of the knitting machine, the improvement comprising

(a) a wire-covered feed roll rotatable about the fixed axis,

(b) a smooth peripheried feed roll located operatively relative to the wire-covered feed roll to provide a nip,

(c) a gap interposed between the periphery of the wire-covered feed roll and the feed plate to provide a passage for the fibers, said gap commencing at the nip and terminating in a fiber pinch point, whereby the nip provides a fiber entrance to the gap and the pinch point provides a fiber exit from the gap,

(d) assembly means joining together the smooth peripheried feed roll and the feed plate to provide a unitary assembly with capacity for movement as a unit relative to the wire-covered feed roll and

(e) resilient means urging the unitary assembly which includes the smooth peripheried feed roll and the feed plate yieldingly toward the wire-covered feed roll,

(f) said resilient means being operative to permit the smooth peripheried feed roll and the feed plate to be retracted away from the wire-covered feed roll to enlarge clearance at the nip and at the fiber pinch point to accommodate an increase in the volume of fibers fed by the fiber feeding system to the knitting machine.

4,408,371

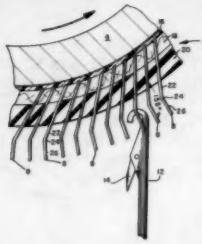
SELF-CLEANING DOFFER WIRE

Earl R. Quay, Orangeburg, S.C., assignor to Mayer, Rothkopf Industries, Inc., Orangeburg, S.C.

Filed Aug. 24, 1981, Ser. No. 295,731
Int. Cl.³ D01G *15/84*
U.S. Cl. 19—114 **3 Claims**

1. Self-cleaning doffer wire for use in card clothing covering the periphery of a rotatable doffer for feeding relatively short fibers to the needles of a sliver high pile fabric knitting ma-

chine, said wire having shank portions embedded in a backing layer and extending outwardly of the doffer at an acute angle to the backing layer, said wires further having distal portions connected to the shank portions by knee portions, characterized by knee portions formed of an angle in the range of about



145° to about 170°, whereby fibers on the card clothing tend to migrate outwardly of the doffer toward the distal portions of the doffer wire to facilitate removal of substantially all fibers from the doffer by the needles as the needles rake the doffer wire.

4,408,372

COUPLER

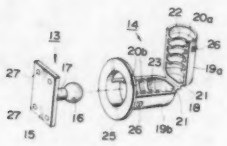
Teiji Kimura, Urayasu, and Shigeru Kimura, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo and Nifco Inc., Yokohama, both of, Japan

Filed Oct. 20, 1980, Ser. No. 198,726

Claims priority, application Japan, Oct. 24, 1979, 54-146229[U]

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—217 R **2 Claims**



1. A coupler for joining two objects, comprising a unitary insertion member adapted to be attached fast to one of said two objects and a reception member adapted to be attached fast to the other object and used for admitting said insertion member into fast engagement therewith, said insertion member being provided with a setting portion for fast attachment to said one object in fixed relation thereto and an integral shaft extended from said setting portion and possessed of a radially expanded engaging portion at the leading and thereof, and said reception member being provided with two generally semicylindrical shells integrally connected to each other freely openably and closably through the medium of a thin-walled integral hinge portion and adapted to form one cylindrical shape upon being closed onto each other along the matched edges thereof and a plurality of like integral resilient engaging pieces regularly spaced in the longitudinal direction on the inner wall of each of the shells, the engaging pieces on one wall being in mirror image with the pieces on the other wall, whereby said reception member is inserted into a fitting hole bored in advance in said other object, with said two shells held in a closed state and consequently said resilient engaging pieces on the inner walls of the shells opposed to each other to enclose therein an engaging hole for admitting said shaft into fast engagement therewith, said engaging hole having a diameter smaller than the outside diameter of the engaging portion to be detachably brought into resilient frictional engagement therewith, at least one opposed pair of engaging pieces being maintained in deformed position by said engaging position of said insertion member.

4,408,373

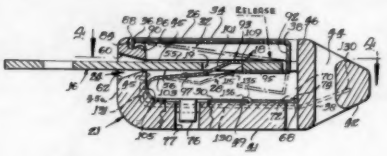
BUCKLE WITH INTEGRAL PUSH BUTTON SPRING AND REACTION PORTIONS

John S. Miskowicz, La Porte, Ind., assignor to Gateway Industries, Inc., Hazel Crest, Ill.

Filed Sep. 2, 1980, Ser. No. 183,384

Int. Cl.³ A44B *11/26*

U.S. Cl. 24—230 A **15 Claims**



14. A seat buckle for latching engagement with a tongue plate, said buckle comprising:

a substantially one-piece plastic body having a downwardly opening cavity;

a one-piece latch means of spring metal having an integral pushbutton portion, an integral latch portion, and integral spring portion and an integral reaction portion positioned in said cavity;

a front wall on said plastic body having a slot extending into said cavity for receiving a tongue plate for sliding entry into said cavity;

an integral latch dog on said latch portion movable between a latching position for latching engagement with said tongue plate and a release position for releasing the tongue plate for withdrawal from said slot, said latch portion being flexed by said integral spring portion with depression of said pushbutton portion relative to said reaction portion to shift said latch dog from said latching position to said release position, said latch means being a substantially Z-shaped member having a substantially upper flat horizontal pushbutton portion covering the top of said cavity and a substantially flat reaction portion at the bottom of said cavity.

4,408,374

BELT LOCK FOR A SAFETY BELT

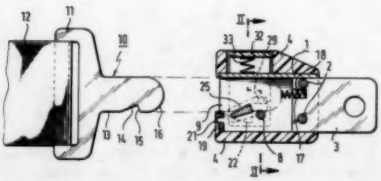
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 250,040

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012937

Int. Cl.³ A44B *11/26*

U.S. Cl. 24—230 A **1 Claim**



1. Lock for a safety belt comprising a belt lock having a

lock-housing with two spaced plates defining an insertion path, a plug-in tongue with a detent for insertion in the insertion path of the lock-housing, a latch mechanism having a latch of wedge-shaped cross section which can swing into the detent of the plug-in tongue when inserted in the insertion path to thereby engage said tongue, said wedge-shaped latch being swingeably supported in a corresponding wedge-shaped opening with a greater wedge angle, said latch bearing with its smaller wedge end in a curved bearing surface of said opening, said latch having at its wide end a convexly curved surface to provide a larger area for contact with said tongue to distribute a force applied to the latch over said larger area, and a pressure organ mounted on the lock-housing movable against the force of a spring to move said latch out of engagement with said tongue to permit withdrawal of the tongue from the belt lock, and wherein at both ends of said latch are fastened lever elements, which are provided with lever pins onto which said pressure organ can be pressed.

4,408,375

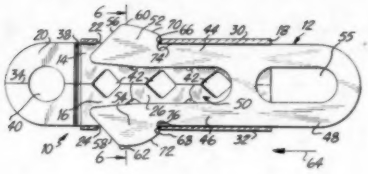
RELEASABLE CONNECTOR

Max Skobel, 10 Lynwood Rd., Edison, N.J. 08817

Filed Sep. 21, 1981, Ser. No. 303,790

Int. Cl.³ A47G *29/10*; A44B *11/25, 15/00*

U.S. Cl. 24—230 R **4 Claims**



1. A releasable connector comprising:

a receiving member having an elongated internal passageway extending from one end thereof, and a pair of diametrically opposing retaining solts spacedly positioned along said passageway, said retaining slots being openings extending through opposing longitudinal edges of said receiving member, said passageway including a mouth at said one end;

a substantially flat elongated insert member having a pair of bifurcated springy legs insertable into said passageway upon compression of said legs together into an abutting position, an outwardly extending foot at a distal end of each leg for releasably locking into a respective one of said retaining slots when said legs spread apart with each foot extending through its associated opening to securely retain said insert member in said receiving member in a locked position;

said insert member feet having a combined transverse width in said abutting position substantially equal to a transverse width of said receiving member passageway to limit said compression of said legs and to provide alignment between said legs and said passageway during insertion of said legs through said passageway;

an outwardly flaring, rearwardly directed first cam surface at a forward end of each foot for engaging said mouth of said passageway to direct said legs together into said abutting position to facilitate entry of said insert member into said passageway;

an arcuate second cam surface on each foot rearward of said forward first cam surface for riding along inner edge walls of said passageway to facilitate passage of said insert member through said passageway;

an inwardly curved, rearwardly directed rear third cam surface on each foot being rearward of said arcuate second cam surface for engaging an edge of a respective retaining slot to facilitate entry of said feet into said retaining slots and to also facilitate exit of said feet from said retaining slots;

a notched junction between each foot and its respective leg, each notched junction having an inwardly directed edge rearward of its associated rear third cam surface, each notched junction edge being disposed in substantially the same direction as its associated first cam surface so that an acute angle is formed between the longitudinal axis of the junction and the insert member longitudinal axis to provide a hook-like portion on its associated foot for locking onto said edge of said respective retaining slot; and

each notched junction including an undercut portion extending inwardly from its notched junction edge to insure that said notched junction edge engages against said edge of said respective retaining slot in said locked position.

4,408,376

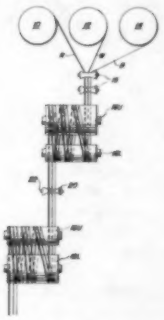
APPARATUS FOR DRAWING YARN

Charles S. Hatcher, Greenville, S.C., and Kenneth E. Smith, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 412,656, Nov. 5, 1973, abandoned. This application Apr. 28, 1978, Ser. No. 900,941

Int. Cl.³ D02J *1/22*; B29C *17/02*

U.S. Cl. 28—245 **7 Claims**



1. Apparatus for cold drawing a plurality of yarns comprising:

(a) a plurality of spaced supply means adapted to supply an equal number of individual yarns;

(b) driven feed roll means adapted to draw said yarns from said supply means in a single, first plane with said yarns arranged in spaced parallel relationship to one another and in a predetermined order relative to one another in said first plane;

(c) heated, driven draw roll means spaced from said feed roll means in the direction of travel of said yarns and adapted to draw said yarns from said feed roll means at a speed greater than the speed of said feed roll means and in a normal, second plane parallel to said first plane with said yarns in said predetermined order relative to one another in said second plane; and

(d) elongated guide means having a concave surface positioned between said feed roll means and said draw roll means with the concavity thereof toward said yarns and the tangent at the midpoint of said concave surface at an angle approximately 45° relative to said second plane and adapted to urge said yarns into contiguous side-by-side relation and in said predetermined order along said concave surface and on said draw roll means.

4,408,377

STUFFING CHAMBER TEXTURIZING PROCESS

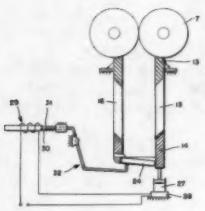
Heinz Schippers, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remschied-Lennep, Fed. Rep. of Germany

Continuation of Ser. No. 927,014, Jul. 24, 1978, abandoned. This application Jan. 5, 1981, Ser. No. 222,600

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1977, 2733455

Int. Cl.³ D02G 1/12

U.S. Cl. 28—250 7 Claims



1. In a stuffer box crimping process for texturizing a yarn of synthetic thermoplastic filaments wherein the yarn is continuously fed with crimping into an elongated stuffing chamber having an interior cross section defined by its inner walls to form an accumulated yarn plug of looped and compressed filaments, said yarn plug exerting irregular frictional forces on said inner walls while being advanced from an upstream stationary entry section to a downstream axially movable outlet section of said stuffing chamber by the force of the fed yarn entering the chamber, and braking the advancing movement of said yarn plug by exerting a discharge resistance thereagainst in said movable outlet section of the chamber, the steps which comprise:

applying the frictional force of the yarn plug as an advancing pressure exerted on a contact surface which forms at least part of the inner walls of said movable outlet section and which is axially movable relative to the inner walls of said stationary entry section;

applying an opposing force to said axially slidable contact surface of said outlet section in an axial direction against the advancing pressure of the yarn plug to counteract the advancing movement of said outlet section relative to said entry section;

continuously measuring and comparing the actual value of the advancing pressure of the yarn plug with a predetermined value, said measurement being effected by measuring said opposing force applied to said axially slidable contact surface; and

adjusting the discharge resistance on said yarn plug in response to the difference between said actual value and said predetermined value, thereby compensating for the irregular frictional forces between said inner walls and said yarn plug.

4,408,378

APPARATUS FOR FORMING A FILAMENT COIL OF FIGURE OF EIGHT CONFORMATION

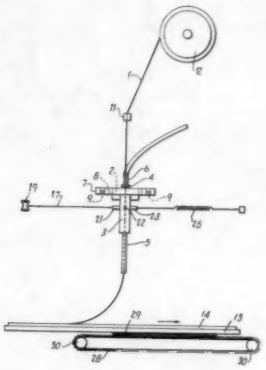
Terence A. Ketteringham, Middlesex; Dennis L. Lewis, Hertfordshire, and David E. Mayley, London, all of England, assignors to Associated Electrical Industries Limited, London, England

Filed May 21, 1981, Ser. No. 265,813

Claims priority, application United Kingdom, Nov. 21, 1980, 8037420

Int. Cl.³ B65H 54/00

U.S. Cl. 28—289 7 Claims



1. An apparatus for forming a filament coil of substantially figure of eight conformation, said apparatus comprising:

(A) a filament guide member consisting of a guide member plate mounted on a vertical shaft;

(B) means providing a central channel through said guide member plate and shaft for the passage of the filament downwards therethrough;

(C) a flat filament receiving carrier disposed below said guide member plate;

(D) said guide member plate being horizontally disposed;

(E) a gimbal mounting arrangement for said guide member, said gimbal mounting arrangement consisting of

(i) a fixed horizontally disposed outer ring and

(ii) an inner ring pivoted on the outer ring for rotation about a first horizontal axis,

(iii) the said guide member plate being pivoted on the said inner ring for rotation about a second horizontal axis at right angles to the first horizontal axis;

(F) two sets of reciprocating means connected to the guide member shaft for imparting to the guide member oscillatory motion about the first and second horizontal axes, respectively, means for controlling the relative rates of reciprocation of the said reciprocating means, to produce the required relative frequencies and relative phases of oscillations of the guide member about the respective horizontal axes;

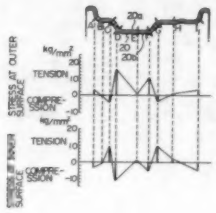
(G) means for guiding the filament path vertically downwards, from a source at a level above that of said guide member plate and gimbal mounting arrangement into the said channel through the guide member; and

(H) means for controlling the speed of downward travel of the filament from said source to the carrier.

4,408,379
METHOD OF PRODUCING AN ALUMINUM WHEEL RIM

Takuo Kusano, Mishima; Kouichi Masuda, Fuji, and Masatoshi Namba, Tokyo, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,639
Claims priority, application Japan, Mar. 19, 1980, 55-034013; Dec. 5, 1980, 55-170866
Int. Cl.³ B21K *1/38;* B21B *15/00*
U.S. Cl. 29—159.1 3 Claims



1. A method for producing an aluminum wheel rim from a thin walled cylindrical element of an aluminum or aluminum alloy material comprising axially pressing the element under the action of compressive stress acting thereon through tapered portions of a die and a punch cooperating therewith in a press machine so that the diameter of the element is enlarged so as to form the required configuration of the rim, while the wall thickness of the element is increased at positions where compressive stress is applied through the tapered portions of the die and the punch thereby increasing the mechanical strength of the element at positions where otherwise weakening tends to occur due to thinning of the wall thickness of the material during roll working thereof, the ratio H/D of the height H of the element with respect to the inner diameter D thereof being set to be equal to or less than 1.5 and the ratio t/D of the wall thickness t of the element with respect to the inner diameter D being set to be in the range of 0.006 to 0.06, while the mean deformation resistance of the material is set to be in the range of 10 to 25 kg/mm² and the inclination angle of the tapered portions of the die and the punch is set to be in the range of 10° to 65°.

4,408,380
METHOD FOR MAKING CONNECTING RODS FOR INTERNAL COMBUSTION ENGINES

Siegfried Schaper; Anton Wimmer, both of Gaimersheim, and Werner Dommes, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,770
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2918028
Int. Cl.³ B23P *15/00;* F02B *75/32;* G05G *1/00*
U.S. Cl. 29—156.5 A 6 Claims

1. A method of making a crankshaft-connecting rod construction for an internal combustion engine having a single-piece crankshaft comprising:

positioning a first crankpin bushing segment, having a connecting rod shank consisting of a reinforced resinous material mounted thereon on a crankpin of said crankshaft;

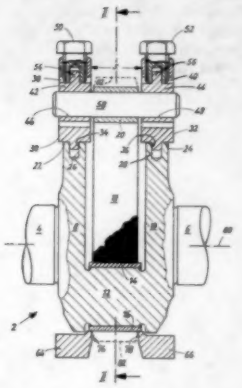
positioning a second crankpin bushing segment in opposed relationship to said first crankpin bushing segment about said crankpin;

positioning a piston pin bushing on said connecting rod shank at an end distal from said first crankpin bushing;

positioning a rigid member in said piston pin bushing with a portion of said member exposed for a clamping operation;

securing a clamping mechanism to said crankpin and arranging said clamping mechanism to engage said rigid member and edge portions of said second crankpin bushing segment;

operating said clamping mechanism to press said rigid member while in said piston pin bushing toward said crankpin and to clamp said first bushing segment against said crankpin, and to press said second bushing segment against said



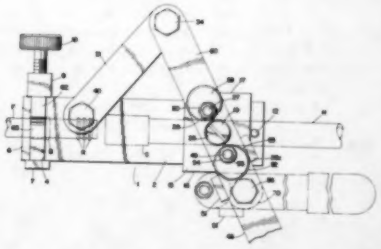
crankpin, to clamp said second bushing segment thereto, while leaving a substantial portion of said bushings and connecting rod shank exposed for application of reinforcing material about the periphery of the bushings; and

applying a reinforcing material about the periphery of said second bushing segment and said piston pin bushing and said connecting rod shank exposed for that purpose to form an integral unit attached to said crankpin.

4,408,381
DEVICE FOR ASSEMBLING A HOSE AND FITTING

Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Continuation-in-part of Ser. No. 186,330, Sep. 11, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 284,967
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—237 8 Claims



1. In a device of the character described for assembling a fitting and a hose, means for supporting a fitting and means for moving a hose in axial alignment with said fitting, whereby to cause a portion of said fitting to enter an end portion of said hose and be frictionally secured to said hose, said supporting means comprising an elongated frame having a socket at one end thereof and a block mounted in said socket, said block having a recess for accommodating said fitting, said hose moving means comprising a slide mounted for reciprocal movement along said frame, a link pivotally secured to said slide, a

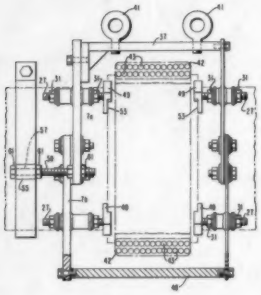
second link pivotally secured to said first link and to said frame, a handle pivotally secured to said first link, a roll mounted on said first link, and a second roll mounted on said handle, said rolls adapted to be moved into engagement with diametrically-opposite sides of said hose.

4,408,382

METHOD FOR REMOVING AND REPLACING SHRUNK-ON SLEEVES ON A SHAFT

Ira J. Campbell, East Bradford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1981, Ser. No. 332,563
Int. Cl.³ B23P *19/00, 11/02*
U.S. Cl. 29—426.1 **7 Claims**



1. A method for removing a sleeve shrunk on a shaft comprising the steps of:

placing an induction coil so that it encircles the sleeve;

attaching a fixture to the sleeve in such a manner that the sleeve and induction coil can be supported by the fixture;

applying alternating current to the induction coil until the temperature of the sleeve rises to a level wherein there is clearance between the sleeve and the shaft;

removing the fixture induction coil and sleeve from the shaft; and

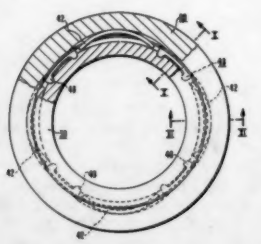
placing insulation around the removed sleeve so that it cools slowly and evenly to minimize distortion of the sleeve.

4,408,383

REMOVABLE SLEEVE-TO-SHAFT INTERLOCK FOR DYNAMOELECTRIC MACHINE

Lawrence D. Nottingham, Hempfield Township, Westmoreland County, and Michael R. Jugan, Duquesne, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 130,491, Mar. 13, 1980, Pat. No. 4,358,700. This application Mar. 30, 1982, Ser. No. 363,730
Int. Cl.³ H02K *15/14*
U.S. Cl. 29—453 **5 Claims**



1. A method of preventing relative axial movement between a tubular sleeve having a central bore and a shaft mountable within said bore, said method comprising:

(A) positioning at least one detent within a groove in the outer circumferential surface of said shaft, said detent being an arcuate member having a radius being less than the radius of the shaft groove, and a height being greater than the depth of said shaft groove, and a material thickness being less than the depth of the shaft groove;

(B) maintaining the detent in a depressed configuration such that its height is no more than the depth of the shaft groove in which it is positioned, and continuing this step until the shaft is mounted in said sleeve;

(C) mounting the shaft within the sleeve with an axial sliding motion so as to radially juxtapose an eccentric groove and said detent, said eccentric groove being located in the inner circumferential surface of said sleeve; and

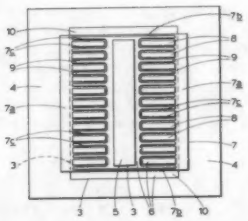
(D) radially juxtaposing a maxima location of said eccentric groove and said detent, permitting said detent to spring into said eccentric groove so that said detent occupies said eccentric groove and said shaft groove simultaneously, and thereby preventing relative axial movement between the sleeve and the shaft.

4,408,384

METHOD OF MANUFACTURING AN INSULATED-GATE FIELD-EFFECT TRANSISTOR

Royce Lowis, Southampton, and Peter M. Tunbridge, Winchester, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 141,518, Apr. 18, 1980, abandoned. This application Aug. 12, 1982, Ser. No. 407,673
Claims priority, application United Kingdom, May 2, 1979, 7915232
Int. Cl.³ H01L *21/265, 21/28*
U.S. Cl. 29—571 **8 Claims**



1. A method of manufacturing an insulated-gate field-effect transistor in which interdigitated source and drain fingers of one conductivity type are provided in part of an epitaxial layer of the opposite conductivity type on a more highly conductive substrate, the source fingers are short-circuited to the substrate, a gate on an insulating layer on the epitaxial layer is provided between the source and drain fingers, and a drain electrode which is interdigitated with the gate is provided to contact said drain fingers, comprising the steps of:

(a) forming on said insulating layer a gate layer having a plurality of separate, mutually parallel apertures; then

(b) introducing dopant determining said one conductivity type into said epitaxial layer via said apertures to form mutually parallel islands of said one conductivity type from which at least a portion of the source fingers is to be provided; then

(c) providing on the epitaxial layer an etch-resistant mask having mutually-parallel apertures, each of which overlies an area of an island and is smaller than the gate layer aperture associated with the island; then

(d) etching away said areas of said islands and underlying parts of the epitaxial layer to form mutually parallel grooves which extend through the epitaxial layer to said substrate, have a V-shaped cross-section, extend longitudi-

nally along said islands and are adjoined along opposite sides by remaining parts of said islands; and then

(e) providing within said apertures of the gate layer and over the walls of said grooves parallel metal fingers which extend longitudinally along said islands to short-circuit the remaining parts of said islands to the epitaxial layer and to the substrate, said remaining parts forming said source fingers of the transistor.

4,408,385

SEMICONDUCTOR INTEGRATED CIRCUIT WITH IMPLANTED RESISTOR ELEMENT IN POLYCRYSTALLINE SILICON LAYER

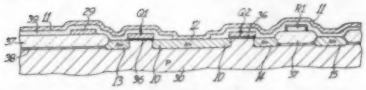
G. R. Mohan Rao; John S. Stanczak; Jih-chang Lien, and Shyam Bhatia, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 916,037, Jun. 15, 1978, Pat. No. 4,208,781, which is a division of Ser. No. 727,116, Sep. 27, 1976, Pat. No. 4,110,776. This application Jun. 23, 1980, Ser. No. 162,217

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ H01L *21/00, 21/263*

U.S. Cl. 29—576 B **3 Claims**



1. A method of making resistor elements in an N-channel, silicon-gate MOS integrated circuit of the static RAM type with field oxide formed surrounding a pair of driver transistor areas having gate oxide formed much thinner than the field oxide, comprising the steps of:

a. applying an elongated strip of polycrystalline silicon t- said face extending across the field oxide and contacting a drain area of one of the transistor areas,

b. forming a resistor region in the elongated strip by implanting conductivity-determining impurity to provide a selected resistivity less than that of undoped polycrystalline silicon,

c. forming conductive regions in the elongated strip on both ends of the resistor regions, the conductive regions being doped at a level much higher than the resistor region, forming conductors electrically connecting said one end to the gate of the opposite one of the driver transistor, and electrically connecting the conductive regions at the other end of the resistor regions in common to a voltage supply.

4,408,386

METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Tetsuya Takayashiki; Taiji Usui, both of Tokyo, and Tetsuma Sakurai, Hachioji, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,751

Claims priority, application Japan, Dec. 12, 1980, 55-174691; Feb. 19, 1981, 56-222238

Int. Cl.³ H01L *21/76, 21/20*

U.S. Cl. 29—576 E **14 Claims**

1. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:

forming spaced recesses having a predetermined depth and an opening size in a surface of a single-crystal silicon substrate of a first conductivity type;

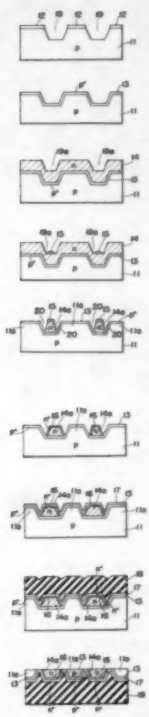
forming a first conductivity type diffused layer of a high impurity concentration on surfaces of said single-crystal silicon substrate and said recesses;

forming a second conductivity type epitaxially grown layer on a surface of said first conductivity type diffused layer;

forming mask layers on selected surface portions of said epitaxially grown layer above said recesses;

removing said epitaxially grown layer at portions other than those immediately beneath and near said mask layers to form second conductivity type island regions in said recesses;

removing said mask layers to expose surfaces of said island regions;



forming second conductivity type diffused layers in said exposed surfaces of said island regions;

forming an oxide film on the surfaces of said first conductivity type diffused layer and said second conductivity type diffused layer;

forming a polycrystalline silicon layer on a surface of said oxide film; and removing a rear surface of said single-crystal silicon substrate until said oxide film is exposed.

4,408,387

METHOD FOR PRODUCING A BIPOLAR TRANSISTOR UTILIZING AN OXIDIZED SEMICONDUCTOR MASKING LAYER IN CONJUNCTION WITH AN ANTI-OXIDATION MASK

Tadashi Kiriseko, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 28, 1982, Ser. No. 425,648

Claims priority, application Japan, Sep. 28, 1981, 56-151986

Int. Cl.³ H01L *21/20, 21/318*

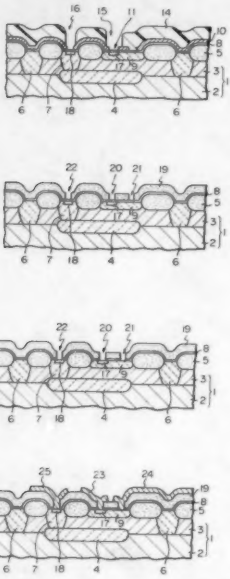
U.S. Cl. 29—576 E **16 Claims**

9. A method for producing a bipolar transistor having a semiconductor substrate, a base region formed in the semicon-

ductor substrate and an anti-oxidation masking layer formed on the base region, comprising the steps of:

a. forming a semiconductor layer on the anti-oxidation masking layer;

b. selectively etching the semiconductor layer to form a first opening for defining an emitter region and a second opening for defining a base electrode;



c. introducing impurities into the base region through the first opening to form the emitter region;

d. converting the semiconductor layer into an oxide layer;

e. selectively etching the anti-oxidation masking layer by using the oxide layer as a mask to expose portions of the emitter region and the base region; and

f. forming electrodes and conductor lines on the exposed emitter and base regions.

4,408,388

METHOD FOR MANUFACTURING A BIPOLAR INTEGRATED CIRCUIT DEVICE WITH A SELF-ALIGNMENT BASE CONTACT

Shuichi Kameyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kasasaki, Japan

Filed Apr. 8, 1981, Ser. No. 252,119

Claims priority, application Japan, Apr. 14, 1980, 55-49020

Int. Cl.³ H01L *21/308*

U.S. Cl. 29—578 **4 Claims**

1. A method for manufacturing a semiconductor integrated circuit device having a plurality of bipolar transistors at least one of which includes a base region, comprising the steps of:

forming a conductive layer directly on the base region;

forming an antioxidant insulation film of high insulation characteristic on said conductive layer;

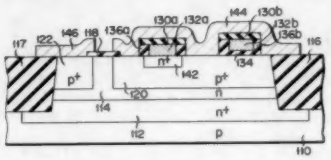
patterning said antioxidant insulation film to form an antioxidant insulation film pattern;

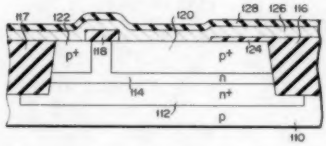
overetching said underlying conductive layer using said antioxidant insulation film pattern as a mask to form a conductive layer pattern such that said antioxidant insulation film pattern overhangs said conductive layer pattern;

thermally oxidizing the circumferential surface of said conductive layer pattern and an exposed part of said base region to grow a first thermally oxidized film on the circumferential surface of said conductive layer pattern and a second thermally oxidized film on the exposed part of said base region;

said first thermally oxidized film being thicker than said second thermally oxidized film;

removing said second thermally oxidized film on said base





region by anisotropic etching with gaseous ions substantially vertically incident on the surface of said base region with said antioxidant insulation film pattern as a mask, thereby exposing a portion of said base region; and

forming a base electrode wiring connected to said base region, said base electrode wiring covering said antioxidant insulation film pattern and said first thermally oxidized film.

4,408,389

ARRANGEMENT FOR ASSEMBLING A WORKING CYLINDER

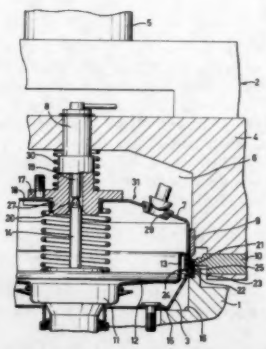
Nabil Henein, Muenster, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,796

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015111

Int. Cl.³ B23P *21/00*; B23Q *15/00*

U.S. Cl. 29—715 **9 Claims**



1. An arrangement for assembling a working cylinder including a first casing shell having a mounting surface for a

member to be actuated and a second casing shell supporting a working piston acting on a push rod in the direction of said member to be actuated comprising:

first means to move said first and second shells into each other to compress an elastic seal disposed therebetween;

measuring means supported from and controlling first means to ensure the actual distance between said mounting surface and a force-transmitting end of said push rod is equal to a predetermined distance; and

second means supported by said first means to connect said first and second shells together in a positive engagement to maintain said predetermined distance;

said mounting surface having a bore therein coaxial of a longitudinal axis of said working cylinder,

said measuring means including an annular collar adjacent one end thereof and a probe disposed concentrically within said measuring means, and

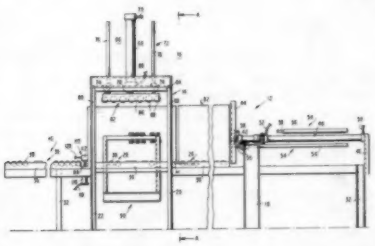
said first means including a plunger piston supporting said measuring means axially with respect to said push rod, to introduce said measuring means into said bore, to move said measuring means to cause said collar to abut said mounting surface to close said bore air-tight and to cause said probe to abut said force-transmitting end of said push rod, said probe opening an electrical contact when said predetermined distance is attained.

4,408,390

APPARATUS AND PROCESS FOR NESTING DRUM BODIES

Norman L. Fischell, 8 Foothill Dr., Kinnelon, N.J. 07405

Filed Jan. 28, 1981, Ser. No. 229,133
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—822 **9 Claims**



1. An apparatus for nesting drum bodies which comprises:

a drum body deformation assembly including means for positioning a drum body therein;

a linear deformation assembly;

means for moving said linear deformation assemblies through said drum body substantially towards an axis of said drum body to effect deformation of said drum body;

drum body feeding assembly including means for moving another drum body about said deformed drum body to a point coextensive with the said deformed drum body; and

means for withdrawing nested drum bodies from said assembly.

4,408,391

CONDUCTOR INSERTION TOOL AND METHOD

Karl-Heinz Pohl, Woodbury, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Feb. 12, 1981, Ser. No. 233,983
Int. Cl.³ H01R *43/04*; B23P *19/00*
U.S. Cl. 29—861 **21 Claims**

1. In a wire installing tool of the type having a handle and a stem, the stem having first and second ends and being reversibly mounted on and extending from the handle, an improved stem comprising:

a body portion, said body portion being apertured to permit installation thereof in the handle;

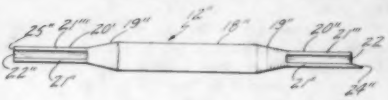
a pair of blade means, said blade means being integral with said body portion and each comprising:

a pair of parallel spatially displaced flange members; and

a web member interconnecting said flange members, said web member being generally transverse to said flange members and being positioned therebetween so as to cooperate with said flange members to define a generally U-shaped channel at either side of said web member; and

a cutting blade extension of at least one of said blade means flange members.

20. A method of installing a wire in an electrical connector, the connector having at least a pair of cooperating contact portions which are resiliently loaded in opposite directions so



as to exert a capture force on the wire and to exert a stripping force for the removal of insulation from the wire during movement of the wire relative to the cooperating contact portions, said method comprising the steps of:

positioning a wire to be installed at the top of the connector and in registration with the junction of a pair of cooperating contact portions;

supporting the wire from one side along the portion thereof which is to be inserted between the contact portions;

engaging the sides of the contact portions which are to act on the wire; and

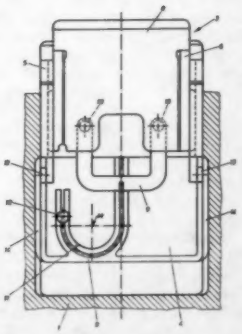
forcing the wire downwardly between the contact portions without restraining movement of the contact portions whereby the contact portions are caused to spread apart by the wire while guiding the movement of the supported wire.

4,408,392

ELECTRIC SHAVER

Gundolf Naimer, Graz, Austria, assignor to Payer-Lux Elektroprodukte Gesellschaft m.b.H., Graz, Austria

Filed Apr. 1, 1981, Ser. No. 249,970
Claims priority, application Austria, Apr. 3, 1980, 1839/80
Int. Cl.³ B26B *19/10*
U.S. Cl. 30—34.1 **7 Claims**



1. An electric shaver having a casing, a shear head and a long-hair cutting unit, characterized in that the long-hair cutting unit is slidably supported by the casing for movement from

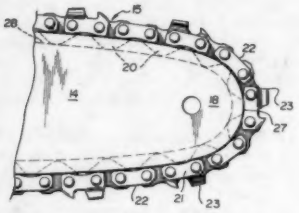
a retracted position in which the long-hair cutting unit lies within the confines of the casing to an extended position in which the cutting unit projects outwardly from the casing, a manually actuatable pusher for moving said long-hair cutting unit from one position to the other, guide means sidably mounting said pusher for movement relative to said casing, and motion multiplying coupling means comprising at least one flexible strip interconnecting said long-hair cutting unit and said pusher, and a semicircular guide in said pusher position to engage said strip and reverse its direction, whereby said long-hair cutting unit moves at least twice the distance through which the pusher travels when actuated.

4,408,393

CHAIN SAW

Bohumil Jerabek, Jerabek & Associates Ltd., Research & Testing Laboratories, POB 8566, Ottawa, Ontario, Canada K1G 3H9

Continuation-in-part of Ser. No. 69,211, Aug. 23, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,433
Claims priority, application Canada, Jun. 8, 1979, 329343
Int. Cl.³ B27B *17/02, 17/12*
U.S. Cl. 30—123.4 **8 Claims**



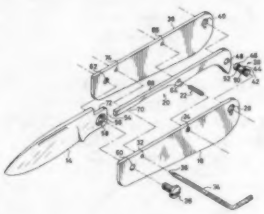
1. In a chain saw:
a saw chain guide bar;
a saw chain;
a drive sprocket; and
lubrication means;
said guide bar being elongate and being symmetrically convexly curved about its longitudinal central axis and having a rounded nose and a pair of unitary peripheral rails;
said saw chain comprising a plurality of chain links in an endless repeating sequence of drive link, tie link, and a couple comprising cutter and balance link, with alternate cutter links being left- and right-hand;
each of said couple of cutter and balance links and each of said tie links having lower edges adapted to maintain continuous contact with the rails of said guide bar, the lower edges of said couple of cutter and balance links each having three curved surfaces, two of said curved surfaces lying on a first arc corresponding to the convex curve along the length of said guide bar, the other one of said three surfaces being centered between two said surfaces and lying on a second arc corresponding to the curve of the rounded nose of said guide bar; the lower edge of each of said tie links having a central curved surface lying on the second arc corresponding to the curve of the rounded nose of said guide bar;
the cutter links of each couple having a height to length ratio no greater than 1:2;
said drive sprocket having teeth the ends of which each have a radius of curvature equal to the radius of curvature of said rounded nose of said guide bar;
said radius of curvature of said guide bar nose being proportional to said chain links such that no more than one cutter link is at any time within an arc of 70° of the longitudinal central axis of the guide bar;
said guide bar having a groove between said rails equal in depth of the portion of the drive link in said groove;
said lubricating means including a passageway in said guide bar communicating at one end with an oil supply and entering at its other end in said guide bar groove, said passageway being angled in the direction of chain movement within said groove.

4,408,394

DISASSEMBLABLE JACK KNIFE

Paul S. Phelps, 1306 Woodlawn Dr., Maryville, Tenn. 37018

Filed Feb. 8, 1982, Ser. No. 346,725
Int. Cl.³ B26B *5/00*
U.S. Cl. 30—157 **10 Claims**



1. A jack knife adapted for disassembly with a pointed rod-like tool, which comprises:
a pair of spaced apart symmetrical liner plates having a blade end and a head end, each of said liner plates being provided with a blade pivot pin receiving aperture at said blade end, a slot of nonuniform width having a maximum width portion and a minimum width portion at said head end, and an aperture intermediate said pivot aperture and said slot to receive a backspring pivot;
at least one head backspring interposed between said liner plates along one edge thereof, said backspring having a blade walk portion and a head portion and being provided with a pivot pin aperture corresponding to said backspring pivot pin apertures of said liner plates, and with an aperture in said head portion corresponding to said maximum width portion of said slots in said liner plates;
at least one knife blade having a tang thereof interposed between said liner plates, said tang being provided with a blade pivot pin aperture, said tang bearing against said blade walk portion of said backspring;
a removable blade pivot pin passing through corresponding blade pivot pin apertures of said liner plates and said pivot pin aperture of said tang;
a backspring pivot pin passing through said backspring pivot pin apertures in said backspring and said liner plates;
a cylindrical locking pin penetrating said aperture of said head portion of said backspring and said nonuniform slot of said liner plates, said pins being provided with annular grooves with releasable engagement with said minimum width portions of said slots; and
wherein said liner plates are further provided with aligned tool-receiving apertures to permit passage of said tool through said liner plates, said tool-receiving apertures positioned such that said blade walk of said backspring intercepts said tool-receiving apertures.

4,408,395

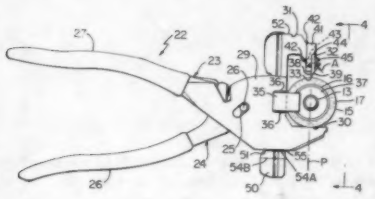
TEXTILE COT REMOVER AND METHOD OF MAKING AND USING SAME

James S. Bryan, Clyde; Ivan Gaster, Hazelwood; Mayo B. Teil, Asheville, all of N.C., and Claude Dunn, Greenville, S.C., assignors to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 125,716, Feb. 28, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 333,084

Int. Cl.³ B26B *17/02*

U.S. Cl. 30—179 **2 Claims**



1. In a hand tool comprising a pliers-like instrument having a pair of members pivotally mounted for movement substantially in one plane and about a pivot having an axis disposed perpendicular to said plane, each of said members having a grasping handle on one side of said pivot and an associated jaw on the opposite side of said pivot, the improvement in said tool adapting same for cutting a textile cot from an associated mandrel and comprising a cutting blade, means detachably fastening said blade to one jaw with a cutting edge thereof disposed parallel to said axis, said tool being adapted to receive a mandrel having a cot supported thereon between its jaws with the axis of said cot disposed parallel to said cutting edge, a positioner provided on one of said members for axially positioning said mandrel and its cot relative to said blade, said tool being adapted to be operated by manually moving said handles toward each other causing said cutting blade to cut said cot along its axial length parallel to the cot axis and thus enable removal of said cot from its mandrel, and a stop carried by said one jaw adjacent said blade on the side thereof opposite the side thereof where said positioner is located, said stop being adapted to engage said mandrel outboard of its cot to stop said cutting edge before it engages said mandrel when said blade is cutting said cot whereby said cot is positioned by said positioner intermediate said positioner and said stop.

4,408,396

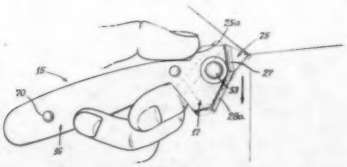
TRIM KNIFE

Albert S. Scholl, 2706 S. Kedvale, Chicago, Ill. 60623

Filed Mar. 15, 1982, Ser. No. 358,198

Int. Cl.³ B26B *3/08*

U.S. Cl. 30—294 **8 Claims**



1. A hand tool for trimming wall covering materials, carpet and the like, comprising: a combined manually-engageable handle and integral blade holder, said blade holder being disposed transversely across one end of said handle and comprising an internal, open-ended blade holding socket aligned in angular intersecting relation to the lengthwise axis of the handle; and locking means for holding a cutting blade in said socket in position to engage materials to be trimmed comprising spring loaded pin means movable transversely through and between opposing walls of said socket and an opening in an intervening cutting blade mounted therein.

4,408,397

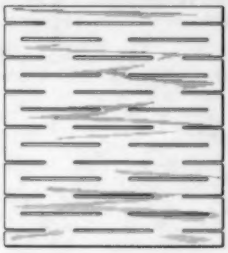
LATTICE PIE TOP CUTTER GUIDE PLATE

Ralph M. Bartos, 6297 Trafalgar Rd., Memphis, Tenn. 38134

Filed Aug. 7, 1981, Ser. No. 291,111

Int. Cl.³ G01B *3/00*; B26C *29/00*

U.S. Cl. 33—174 T **1 Claim**



1. A cutting guide plate for cutting dough to form a lattice pie top crust, said guide plate comprising:

a flat plate made from any suitable material and of adequate thickness with sufficient length and width to cover the piecrust dough a plurality of rows of elongated slots disposed in said plate, the slots in each of said rows being separated at their end or ends by predetermined equally spaced intervals so aligned alternately and equidistant apart such that no spaced interval is aligned directly above or below like spaced intervals in the immediately preceeding and succeeding rows, whereby the dough can be cut in such a manner that when subsequently stretched and applied to a pie will constitute a continuing series of obtuse and acute angles forming said lattice pie top crust.

4,408,398

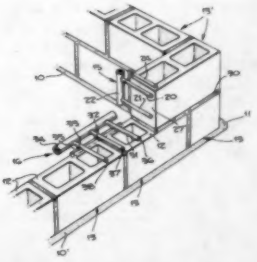
GAGE FOR LAYING BLOCKS

John R. Glaze, 8250 Lankershim Blvd., Space 7, North Hollywood, Calif. 91605

Filed Sep. 16, 1981, Ser. No. 302,496

Int. Cl.³ G01B *3/30, 5/25*

U.S. Cl. 33—180 R **6 Claims**



1. A gage member for the laying of multiple courses of individual blocks wherein the blocks have vertical and horizontal transverse faces for application of mortar and exposed faces and wherein the individual blocks in the wall are spaced by both vertical and horizontal mortar joints, said gage member comprising a positioning guide for engagement with ex-

posed faces of the blocks, spacer means comprising a plurality of parallel horizontally spaced spacer rods anchored to said positioning guide and adapted to overlie the transverse faces when mortar is applied, said rods having portions of substantially equal length extending outwardly of said positioning guide, and a handle rod anchored to certain of said portions at a location spaced from said positioning guide.

4,408,399

WHEEL ALIGNMENT GAUGE

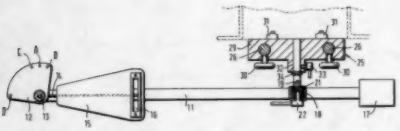
Phillip I. Darwood; Ernest Holland, both of Daventry; Peter M. Taylor, Flore, and Christopher Marley, Hardingstone, all of England, assignors to V. L. Churchill Limited, Daventry, England

Filed Nov. 20, 1981, Ser. No. 323,286

Claims priority, application United Kingdom, Nov. 22, 1980, 8037526

Int. Cl.³ G01B 5/255

U.S. Cl. 33—203.18 **6 Claims**



1. A wheel alignment gauge comprising a pair of beams; means for mounting said beams on or against a different one of a pair of vehicle wheels or axles for such wheels, such that one end of each beam extends beyond the outer circumference of the wheel; each beam has an arm which is pivotally mounted at the end thereof which extends beyond the circumference of the wheel, each of said arms having a pointer which sweeps a scale calibrated to give an indication of the angular position of the arm with respect to the beam; each arm is provided with means by which it may be connected to the other arm with an elastic link, said means being adjustable between: a central position in which the line of action of the elastic link through the pivot point of each arm will be parallel to the axis of rotation of the vehicle wheels, when the pointer is on the zero point of the scale; and a position displaced to one side of said central position, such that the line of action of the elastic link through the pivot point subtends a pre-determined angle θ to the line of action to the elastic link when in its central position, the angle θ corresponding to the steering angle at which "toe out on turns" of the vehicle wheels may be measured.

4,408,400

METHOD OF AND APPARATUS FOR DRYING FRESHLY PRINTED SHEETS AND OTHER SUBSTRATES BY INFRARED OR ULTRAVIOLET RADIATION

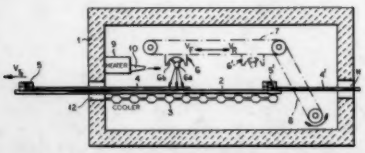
Fabio Colapinto, Milan, Italy, assignor to Argon Industrie Meccaniche s.r.l., Milan, Italy

Filed Oct. 2, 1981, Ser. No. 307,960

Claims priority, application Italy, Oct. 16, 1980, 25378 A/80

Int. Cl.³ F26B 3/30

U.S. Cl. 34—4 **10 Claims**



1. A method of drying freshly printed substrates of sheet material successivly advancing along a predetermined path through a heating chamber,

comprising the step of irradiating a printed surface of a substrate traversing said chamber by a source of radiant energy tracking the advancing substrate along said path, with a substantially constant relative velocity consistent with the rate of irradiation required for drying the print on said surface during the time available for a traverse of said chamber.

4,408,401

ONE-PIECE, WASHABLE AND STERILIZABLE PLASTIC SHOE

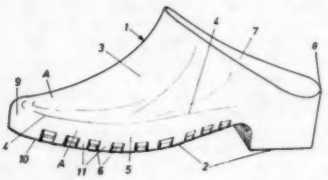
Hartmut Seidel, Hamburg, and Winrich B. Hammerschmidt, Schenefeld, both of Fed. Rep. of Germany, assignors to NATEC Institut, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 171,666

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930807

Int. Cl.³ A43B 7/06

U.S. Cl. 36—3 B **14 Claims**



1. A one-piece, washable and sterilizable plastic shoe made from an elastic, robust plastic material, comprising:

a lower part with a top on which bears the foot and a bottom enveloping an outsole and a heel, as well as an upper part extending onto the lower part forming a cavity for receiving the toes, ball and metatarsus; and

ventilating openings (**6**) located in a substantially vertical lateral area (**5**) of the upper part of the shoe spaced from one another over the outsole edge (**10**), said ventilating openings having upper and lower outer boundary edges (**12, 13**) that are lower respectively than the corresponding upper and lower inner boundary edges (**14, 15**) thereof.

4,408,402

SUPPORTIVE SHOE AND INSERT

Judy A. Looney, 10112 Watkins Mill Pl., Gaithersburg, Md. 20879

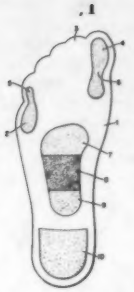
Filed Aug. 5, 1982, Ser. No. 405,364

Int. Cl.³ A43B 13/38, 13/42

U.S. Cl. 36—43 **8 Claims**

1. A shoe insert to provide increased support during the first and second trimesters of pregnancy comprising a flexible pad adapted to extend substantially beneath the entire foot from heel to toe, said pad having integrated therewith foot support means comprising areas of greater rigidity than the rest of said flexible pad, said foot support means comprising a substantial inflexible area of maximum support in the arch and individual

areas of moderate flexibility and support (1) in the heel, (2) extending from the arch area of maximum support toward the



heel and toes, and (3) extending from the big and little toes under their respective ball areas.

4,408,403

SPORTS SHOE OR BOOT

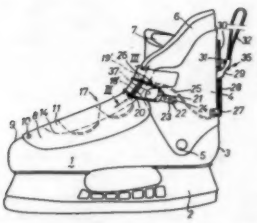
Hans Martin, Chasernweg 7, Kloten, Switzerland

Filed Aug. 3, 1981, Ser. No. 289,171

Claims priority, application Switzerland, Aug. 11, 1980, 6069/80; Feb. 27, 1981, 1351/81

Int. Cl.³ A43B *5/04, 11/00, 5/16*

U.S. Cl. 36—115 **14 Claims**



1. An improved sports shoe or boot particularly for ice hockey having an upper with openable instep flaps for putting on and taking off the boot, a leg plate at least partially encompassing the calf side of the upper, tightening means including at least one pull cord and a tightening member, the pull cord passing alternately from one instep flap to the other and being guided by guide pieces attached to the flaps and attached to the tightening member, the improvement comprising:

a covering tongue coupled to the upper at the cap portion thereof, said covering tongue extending over the openable instep flaps;

mounting means on said covering tongue for receiving at least one turn of said pull cord; and

means spaced from said covering tongue for receiving and guiding an end of said pull cord.

4,408,404

PIVOTABLE ARTICULATED SUPPORT SHOE FOR HYDRAULIC NOZZLE

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Sep. 8, 1980, Ser. No. 185,309

Int. Cl.³ E02F *3/92*

U.S. Cl. 37—58 **16 Claims**

1. A dredge vehicle capable of moving along the floor of a body of water, the dredge vehicle comprising:

(a) a chassis;

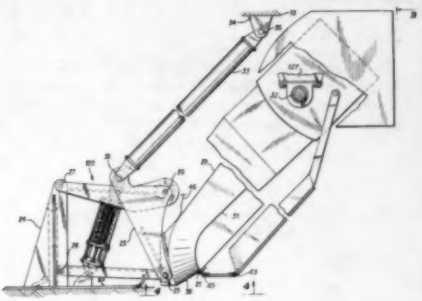
(b) a nozzle pivotally supported from its top by the chassis;

(c) a support surface adjacent the nozzle bottom;

(d) support surface connecting means for pivotally connecting the support surface to the nozzle, the connecting means comprising four pivotally interconnected rigid connecting members, the pivotal connections of which define a first parallelogram linkage assembly;

(e) a first rigid supporting member pivotally connected at one portion to the chassis and at a second portion to the support surface connecting means;

(f) a second rigid supporting member pivotally connected at one portion to the nozzle and at a second portion to the



first supporting member at a second portion thereof, in a manner such that the pivotal connections between the chassis and the nozzle, the nozzle and the second supporting member, the second and first supporting members, and the first supporting member and the chassis, define a second linkage assembly, wherein straight lines connecting the pivotal connections define a parallelogram;

(g) assembly connecting means for maintaining one side of the first parallelogram linkage assembly at a constant angle in relation to one side of the second linkage assembly such that the support surface is maintained at a fixed angle in relation to the horizontal.

4,408,405

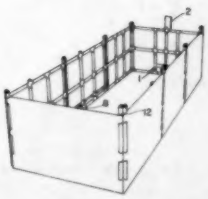
UNDERWATER EXCAVATOR

Harry S. Williams, West Jefferson; Jan B. Yates, Reynoldsburg; John J. Reidy, Orient, all of Ohio; Ernest Faccini, Marbury, Md.; Terry E. Hill, Thornville, and William K. Shafley, Columbus, both of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1981, Ser. No. 250,471

Int. Cl.³ E02F *5/00*

U.S. Cl. 37—62 **12 Claims**



1. An underwater excavator for excavating a sensitive ordnance device comprising plural contiguous barrier wall members, wherein each of said members consists of a covered rectangular framework of hollow conduit with upper and lower horizontal members, where, each horizontal member comprises a part of the exterior barrier wall, with means to

pump pressurized fluid through selected portions of the said horizontal members and where selected horizontal members are fitted with multiple nozzle means located along the underside of one or more said horizontal members, means to pump pressurized fluid through the said horizontal members and into the barrier nozzle means combined with a fluid driven jet pump eductor that produces differential pressure within the confines of the excavator, and means to pump pressurized fluid through the said eductor in order to remove suspended solids from the confines of the excavator so that the suspended solids are removed from the confines of the four barrier walls of the excavator by the differential pressure produced by pressurized fluid being pumped through said hollow conduit and into the jet pump eductor.

4,408,406

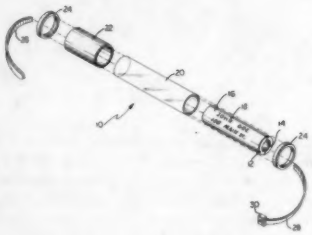
LUGGAGE IDENTIFICATION TAG

C. D. Barton, 815 W. 53rd Ter., Kansas City, Mo. 64112

Continuation-in-part of Ser. No. 268,583, May 29, 1981, abandoned. This application Sep. 21, 1981, Ser. No. 303,919

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—19 **8 Claims**



1. An An identification tag for a luggage item, comprising:

a substantially tubular member having open opposite ends and presenting a continuous passage extending longitudinally therethrough between the opposite ends of said tubular member;

a label connected with said tubular member, said label being adapted to have identification information entered thereon;

an elongate flexible strap extending loosely through said passage of the tubular member and said opposite open ends, said strap having portions externally of said passage and adapted for attachment to the luggage item to attach said tubular member and label thereof with both ends of the tubular member supported by the strap while permitting said tubular member to move longitudinally on said strap and to rotate about the axis thereof; and

a tubular band sleeved on said tubular member for movement thereon, said band being arranged to cover at least part of the identification information on said label at all positions of the band and to expose the identification information part by part as the band is moved on the tubular member.

4,408,407

PANEL SIGN

Hanley D. Bloom, Los Angeles; Stanley Bloom, Beverly Hills; Fred E. Perry, Pomona, and Sam Leone, Canoga Park, all of Calif., assignors to Architectural Signing, Inc., Marina Del Rey, Calif.

Filed Jun. 4, 1982, Ser. No. 385,281

Int. Cl.³ G09F *15/00*

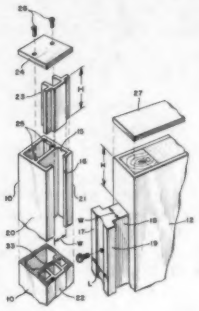
U.S. Cl. 40—607 **6 Claims**

1. A panel sign including, in combination:

(a) at least one extruded post having a hollow interior with one side having an elongated slot communicating with said interior;

(b) a panel having an edge flange of general T-shape in cross section, the width of the stem of said T-shape corresponding to the width of said slot and the length of the cross of the T corresponding to the interior distance between the opposite post side walls connecting to the wall containing said slot so that said edge flange can be received in said slot to provide lateral support for said panel; and

(c) an elongated extruded filler element receivable in the hollow interior of said post, said element having a cross section comprised of a forward portion of width corresponding to said slot, an intermediate portion defining



oppositely extending arms for engaging the interior of said opposite post side walls and a rear portion defining a pair of legs extending rearwardly to engage an interior rear wall of the post opposite the wall containing said slot, said forward portioon filling said slot to provide an exterior finshed appearance to said post along the length of the post within which the extruded element is received, said extruded element having a length less than the length of the post so that after being received in the post, there remains room for the post to receive said edge flange of said panel, the lower end of said edge flange seating on said extruded element to provide vertical support for one end of said panel.

4,408,408

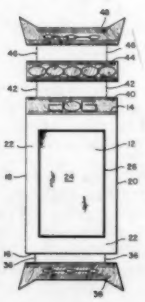
DECORATIVE MOUNTING SYSTEM

Fe C. Eng, 405 E. Seqium Bay Rd., Sequim, Wash. 98382

Filed Jul. 10, 1981, Ser. No. 282,095

Int. Cl.³ G09F *17/00*

U.S. Cl. 40—617 **3 Claims**



1. Decorative hanging and mounting system for art work, graphics and the like, comprising:

a generally rectangular, flexible base fabric material having front and back surfaces and upper, side and lower ends,

cloth border material adhered to the four borders of said base material over predetermined portions of the front surface of said base fabric material and folded around the edges of said base fabric material and also adhered to the back surface thereof, said fabric border material defining an art and graphic area on the front surface of and of lesser size than said base fabric material,

decorative edge stripping overlying and adhered to the edges of said fabric border material and said rectangular art and graphics area,

wooden securing members at each of the upper and lower ends of said base fabric material such that said wooden securing members are at least partially wrapped at least by said base fabric material at said upper and lower ends, and

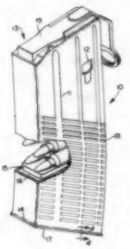
solid decorative weight members at the upper and lower ends detachably secured to said wooden securing members.

4,408,409

AMMUNITION MAGAZINE PACKAGE COMBINATION

Adolfo Arias L., Box 741, Panama, Panama

Filed Feb. 24, 1981, Ser. No. 237,712
Int. Cl.³ F41C *25/02*
U.S. Cl. 42—50 **15 Claims**



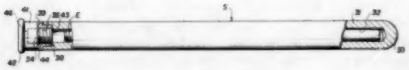
1. An ammunition magazine-package unit for use in firearms, including a hollow magazine body to receive ammunition for subsequent feeding at one end of the magazine body into a chamber of a firearm, means in the hollow body for biasing ammunition toward the dispensing end of the magazine, and a tamper-proof removable seal sealingly joined with the magazine body in the area of the dispensing end, the seal having a pull tab for removing the seal from the magazine body such that said seal breaks contact with the body in a progressive manner to expose an area designed to serve as an opening for feeding of the ammunition after removal of said seal.

4,408,410

HAND GUN AND KIT THEREFOR

Anthony A'Costa, 2216 - 7th Ave., Apartment C 301, Pueblo, Colo. 81003

Division of Ser. No. 70,466, Aug. 28, 1979, Pat. No. 4,368,589. This application Sep. 29, 1982, Ser. No. 426,344
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **2 Claims**



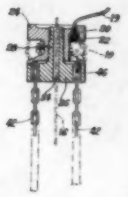
1. A nightstick for carrying a barrel extension for a weapon comprising a cylindrical member having a central bore defined by an inner wall closed at one end and open at the other end, said central bore having a length and an inner diameter for loosely accommodating said barrel extension therein in a concealed position, said cylindrical member inner wall having an internally threaded portion adjacent said open end and a closure member having an externally threaded portion of reduced diameter forming a shoulder, said closure member threaded portion arranged for threaded engagement with said internally threaded portion on said cylindrical member with said shoulder in abutting engagement with said cylindrical member other end for concealed storage of said barrel extension in said cylindrical member.

4,408,411

FISHING LURE RETRIEVER

David B. Skarnells, 5925 Samuel St., La Mesa, Calif. 92041

Filed May 21, 1981, Ser. No. 265,727
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—17.2 **4 Claims**



1. A lure retriever comprising:

a body;

means on said body to engage a fishing line in sliding relation;

an attachment point for a cord;

a plurality of chains depending from said body to ensnare the hooks of a lure on the end of said fishing line, said chains being releasably mounted to said body to permit cleaning and replacement of same; wherein said body comprises a base with coaxial threads and a spool engageable on said threads and being axially advanceable thereon toward said base; and

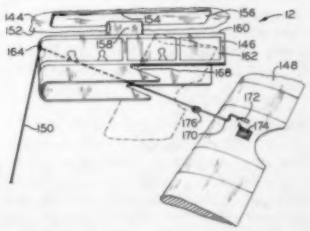
said base has therethrough passageway pairs for passing chain loops and defines a link seat between each passageway pair such that tightening said spool down captures any link seated in said link seat to define a pair of depending chains passing through said passageways.

4,408,412

TOY AIRCRAFT AND METHOD OF OPERATION

Richard O. Forker, 104 Oak Tree Ct., Logansport, Ind. 46947

Filed Jul. 20, 1981, Ser. No. 284,608
Int. Cl.³ A63H *3/06*
U.S. Cl. 46—89 **4 Claims**



1. A toy aircraft, comprising:

a blimp adapted for containing a lighter-than-air gas, and

including a base attached to an undersurface thereof and a flange member connected to said base in a generally perpendicular manner,

a gondola being attached to said flange member and having a top surface and a wall downwardly disposed therefrom, said gondola having a guide means, and a wedge slot in the bottom surface of said wall,

an airfoil releasably attached to said gondola wedge slot,

a line securely attached slidably to said gondola through said guide means, a first end of said line being releasably attached to said airfoil and a second end of said line held by an operator of said aircraft,

an object attached to said airfoil, and

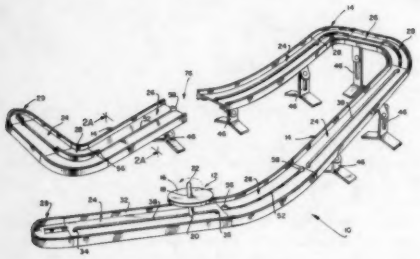
a retaining means attached to said line for maintaining control of said blimp, whereby when said blimp becomes airborne said object may be released by pulling on said line and descended slowly to the ground.

4,408,413

DYNAMIC TOY APPARATUS

Joseph Hyland, 344 E. 63 St., New York, N.Y. 10021, and Joseph J. Wetherell, 20 Woodsbridge Rd., Katonah, N.Y. 10536

Filed Oct. 19, 1981, Ser. No. 312,738
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—241 **14 Claims**



1. A dynamic toy apparatus utilizing kinetic rotary energy of a spinning top for conversion to translatory motion comprising a top having a stem and a body portion, stationary guidance means having a runway for supporting the spinning top on one end of the stem in a substantially vertical orientation, the guidance means further having acceleration means including an elongated member mounted within said runway, said member being adapted for providing a contact surface for said end of the stem and for magnetically interacting therewith to impart a linear velocity to the top.

4,408,414

DETECTION APPARATUS AND METHOD OF USE

Fredric R. Lehle, Lansing; James W. Maine, Mason; David Grossman; Richard A. Leavitt, both of Lansing, and Alan R. Putnam, Haslett, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

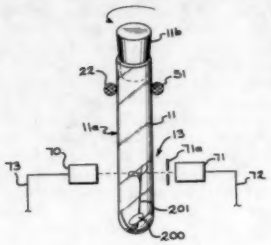
Filed Apr. 19, 1982, Ser. No. 369,633
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—1 R **17 Claims**

1. An apparatus useful for determining the presence of a small object at a station (**13**) which comprises:

(a) indexing means (**10**) for providing the object at the station, wherein the object is supported by a holder (**11**) rotatable around an axis at the station and provided on a carrier (**12, 81**) for movement by the indexing means into and out of the station and wherein the indexing means stops the holder on the carrier at the station for a predetermined period of time;

(b) drive means (**14**) at the station to cause rotation of the holder (**11**) around the axis while the carrier is stopped at the station;

(c) photoelectric detection means including a coherent light beam emitter (**70**) and a light beam detector (**71**) responsive thereto such that when the holder is stopped at the



station and rotated on the axis the light beam is interrupted by the object at the station; and

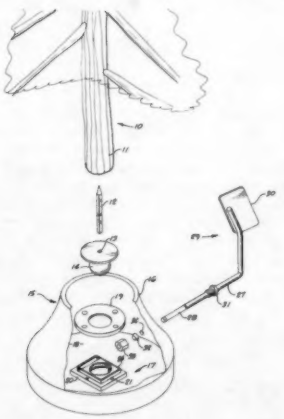
(d) electrical means (**102, 114**) responsive to the detector determining the presence of the object at the station when the light beam is interrupted by the object as the holder is rotated.

4,408,415

CHRISTMAS TREE STAND

Billy R. Davis, 1486 Francis Ave., Upland, Calif. 91786, and Bob G. Davis, 150 S. Beach Blvd., La Habra, Calif. 90631

Filed Sep. 13, 1982, Ser. No. 419,452
Int. Cl.³ A01G *29/00*
U.S. Cl. 47—40.5 **13 Claims**



1. A Christmas tree stand which is readily adjustable to straighten the Christmas tree, said stand comprising:

a ball member having means for attachment to the base of a Christmas tree;

a ball holding assembly having clamp means moveable between a first position and a second position, said first position being such that the ball member may move readily about in said clamp means and said second position being such that said ball member is held securely therein in a fixed position;

remote control means affixed to said clamp means to move the same from said first position to said second position said remote control means being operable by a shaft; and

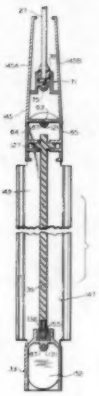
a water container surrounding said ball holding assembly and extending sufficiently upwardly to hold water above the uppermost portion of said ball member when said ball member is held in said clamp means and wherein the shaft of the remote control means extends through the side of said water container.

4,408,416

PET ACCESS DOOR PANEL

George N. Davlantes, 18307 Burbank Blvd. #54, Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 811,949, Jun. 30, 1977, which is a division of Ser. No. 622,067, Oct. 14, 1975, Pat. No. 4,047,331.
This application Dec. 21, 1978, Ser. No. 971,674
Int. Cl.³ E0B6 *7/28*
U.S. Cl. 49—168 2 Claims



1. A door frame comprising:
a pair of upright stiles;
first rail means extending between said stiles;
second rail means positioned beneath said first rail means and extending between said stiles;
weather pane means having a laterally extending edge portion;
telescoping mounting means carried by at least one of said first and second rail means and telescopingly receiving at least an upper or lower end of said weather pane means, said telescoping mounting means including
a transverse stiffener means,
mutually converging non-parallel resilient wall means converging from said transverse stiffener means on said laterally extending edge portion only, sealably and yieldable engaging in continuous compressive contact said pane means and operable to accommodate vertical adjustment of said weather pane means while remaining telescopingly compressively and sealingly engaged therewith to prevent air transfer through said mounting means.

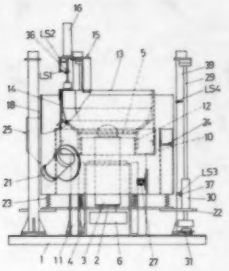
4,408,417

FULLY AUTOMATIC BARREL FINISHING MACHINE

Hisamine Kobayashi, and Mutsumi Miyashiro, both of Nagoya, Japan, assignors to Shikishima Tipton Mfg. Co., Ltd., Nagoya, Japan

Filed Oct. 21, 1981, Ser. No. 313,996
Claims priority, application Japan, Oct. 31, 1980, 55-154498; May 6, 1981, 56-65536[U]; Sep. 17, 1981, 56-146620
Int. Cl.³ B24B *19/00*
U.S. Cl. 51—163.2 13 Claims

1. A workpiece finishing machine for the surface finishing, radiusing, gloss polishing, deburring, milling and the like, which comprises:
a dual-barrel structure for containing a mass of a lot of workpieces to be processed and an abrasive media and consisting of an upper stationary container and a lower rotary container either of which is movable away from the other; and



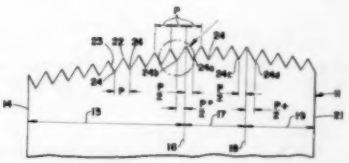
an annular mass receptacle trough structure surrounding close to said dual-barrel structure and including means for causing said mass receptacle trough structure to be moved up and down, vibration generating means for causing said mass receptacle trough to be vibrated, means for separating the mass into workpieces and abrasive media, and means for returning the abrasive media for reuse.

4,408,418

METHOD OF FORMING THROUGH-FEED CYLINDRICAL THREAD ROLLING DIES

Richard H. Corrette, Cleveland, Ohio, assignor to Colt Industries Operating Corp., Cleveland, Ohio

Division of Ser. No. 113,719, Jan. 21, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 314,688
Int. Cl.³ B23G *1/36*
U.S. Cl. 51—288 6 Claims



1. A method of forming cylindrical throughfeed thread rolling dies with substantially flat flanks, a leadin taper portion, and a dwell portion comprising forming a grinding wheel with at least one female thread form having substantially straight flanks, and with said grinding wheel grinding both flanks of a thread form on said die with uniform spacing between the crests thereof along the entire length of said die and uniform root spacing except at the junction between said portions wherein the root spacing between adjacent roots is increased, said grinding wheel being formed with a taper section and a uniform diameter section both of which are formed with a plurality of annular tooth forms, and forming said tooth forms on said grinding wheel with uniform spacing between the roots along the entire length of said wheel and forming the spacing between crests on said wheel uniform except at the junction between said sections wherein a greater spacing is provided between adjacent crests, and with said grinding wheel grinding said lead-in taper with said taper section of said grinding wheel

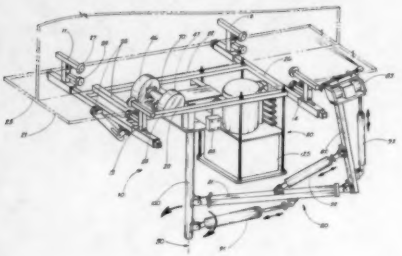
and grinding said dwell portion with said uniform diameter section of said grinding wheel.

4,408,419

APPARATUS AND METHOD FOR SANDBLASTING FLANGED BEAMS

Tom J. Appling, 5706 Shoalwood St., Austin, Tex. 78756

Filed Dec. 3, 1980, Ser. No. 212,509
Int. Cl.³ B24C *3/06*; B24B *1/00*
U.S. Cl. 51—429 **9 Claims**



1. A remotely controlled apparatus for sandblasting flanged beams having at least a web and an attached flange, said apparatus comprising:

a. a carriage mountable on the underside of a flange of the beam to be sandblasted and having at least a pair of longitudinal members and a pair of transverse members;

b. a pair of left and a pair of right leg support means for attaching said carriage respectively to the left and right lateral edge portions of the beam flange, each of said leg support means comprising:

i. an upper support roller for riding on the upper surface of said beam flange;

ii. a lower support roller for engaging the underside surface of said beam flange;

iii. a lateral support roller for engaging the latermost edge of said beam flange and preventing lateral movement of said carriage with respect to the beam;

c. at least one powered wheel rotatably mounted on said carriage and frictionally engaging the underside of the beam flange;

d. articulated means movably attached to said carriage for varying an angle of attack of a nozzle means during sandblasting operation and permitting a 360 degree rotation of said nozzle means around the beam to be sandblasted.

4,408,420

DOUBLE WALLED UNDERGROUND STORAGE CONTAINERS FOR FLUIDS SUCH AS HEATING OIL WHICH ENDANGER THE GROUND WATER AND A METHOD FOR THEIR MANUFACTURE

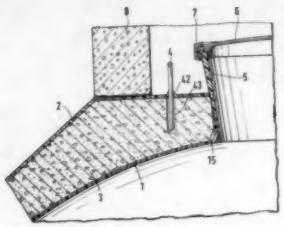
Harry Haase, Gadelander Str. 172, 2350 Neumünster 1, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 752,842
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 25587375
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—1 **13 Claims**

1. Double-walled underground storage container for fluids, such as heating oil, which upon leaking are capable of endangering the purity of the ground water, comprising

an inner and a surrounding outer wall of synthetic plastic material which define with one another a gap forming a continuous leak monitoring space;

a body of open-pore material continuously permeable to air and liquid filling said gap and bracing the inner wall against the outer wall and forming with said walls a homogeneous unit capable of withstanding and absorbing tensile, compressive and torsional forces, said material being synthetic concrete with a compression-resistant structure of filling material having no small components and forming the static load bearing layer of the container, the ratio of synthetic resin present in said synthetic concrete relative to the amount of filling material being such that a



sufficient wetting of the particles of said filling material is achieved to assure bonding of said particles to one another but without impairing the permeability of said body; and

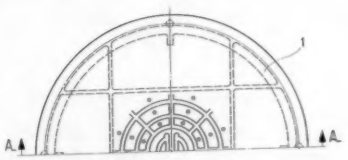
means for monitoring said space and for detecting pressure variations in the same.

4,408,421

MANHOLE STRUCTURE

Yang-Kuang Pai, 2 Floor, No. 27, Lane 305, Wo-Lung St., Taipei, Taiwan

Filed Apr. 30, 1981, Ser. No. 259,483
Int. Cl.³ E02D *29/14*
U.S. Cl. 52—20 **5 Claims**



1. An improved manhole structure, which comprises;

(a) a circular cover having a rim inclined at 45° inwardly of the periphery of said cover to define a continuous conical contact surface, a plurality of lug protrusions extending from said contact surface;

(b) a ring having an axial inner wall and an axial outer wall and an upper face and a lower face, both said upper and lower faces being inclined inwardly at 45° to define continuous conical surfaces, on the said upper face there are a plurality of holes so shaped and located to engage with the protrusions on the cover contact surface, and on the said lower face there are a plurality of lug protrusions, and

(c) an annular base having an upper surface inclined inwardly at 45° and a flat lower face, on the said upper surface there are a plurality of holes so shaped and located to engage with the protrusions formed on the lower face of the said ring.

4,408,422

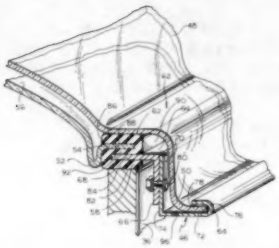
SKYLIGHT DOME ASSEMBLY

Stephen K. Bechtold, 28 Soundview Ave., East Northport, N.Y. 11731

Filed Jun. 10, 1982, Ser. No. 387,215
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—72 **8 Claims**

1. A skylight assembly adapted to be mounted to cover an opening in a roof structure comprising: a liner adapted to be

mounted adjacent the edge of the opening in the roof structure around the periphery to surround the opening and to form a wall extending upward from the roof structure, an outer dome and an inner dome spaced from one another and with the outer dome overlying the inner dome, both of said domes engaging sealing means positioned on the liner wall, a supporting frame coupled to said dome and sealing means arrangement and the frame and arrangement being hinged to said liner to permit shifting thereof with respect to the liner between a closed position overlying the opening in the roof structure and an open position permitting access to the opening from the exterior of the roof structure, the supporting frame having a U-shaped end portion to receive the peripheral edge portion of the outer dome therein and thereby support the outer dome, the sealing means being a gasket positioned around the upper peripheral surface of the wall of the liner, the inner side of the gasket having a slot therein adapted to receive and seal the peripheral edge of the inner dome, the outer side of the gasket having a slot therein to sealingly engage the supporting frame attached to the outer dome, and a portion of the outer dome inwardly spaced from its outer peripheral edge resting on the upper side of the gasket.



4,408,423

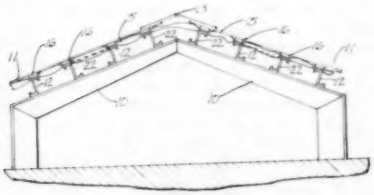
ROOF CONSTRUCTION WITH STABILIZED Z-PURLINS

Richard W. Lautensleger; George R. Bingham, both of Middletown, Ohio, and Peter J. Trepanier, Houston, Tex., assignors to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 844,609, Oct. 25, 1977. This application Apr. 2, 1979, Ser. No. 26,187

Int. Cl.³ E04B *7/00*; E04D *13/00*

U.S. Cl. 52—90 **23 Claims**



1. In a roof construction having a least one roof slope with an upper and lower end, said at least one roof slope having at least four Z-purlins secured to a plurality of rafters transversely thereof, each said Z-purlin having upper and lower flanges, the upper flanges of adjacent purlins being substantially spaced from each other, and a roof deck secured on top of said Z-purlins, at least two of said Z-purlins on said at least one roof slope being oriented to face downwardly of said roof slope and at least two Z-purlins on said at least one roof slope being oriented to face upwardly of said roof slope, whereby to counterbalance tendencies toward Z-purlin roll over failure.

4,408,424

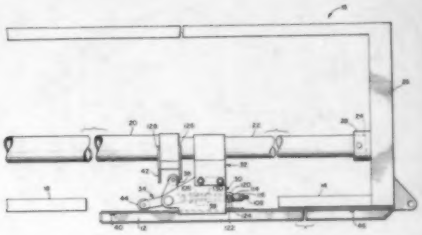
TELESCOPING CYLINDER STABILIZER

Gerald Sutter, El Dorado, Kans., assignor to Richard K. Teichgraeber, El Dorado, Kans.

Filed Mar. 20, 1981, Ser. No. 245,814

Int. Cl.³ E04H *12/34*; B66C *23/06*

U.S. Cl. 52—115 **20 Claims**



1. A telescoping cylinder stabilizer for stabilizing a cylinder and rod which telescopingly extend and contract a mast assembly, said cylinder stabilizer comprising:

a support body moveably carried on a lower mast portion of the mast assembly;

a rod encircling clamp carried by said support body and engaging said rod;

means to move said support body along said lower mast portion during extension and contraction of said cylinder and rod; and

means for securing said stabilizer in place to stabilize said rod when said rod and cylinder are extended.

4,408,425

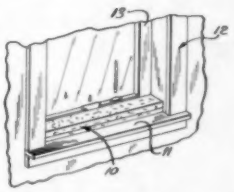
WINDOW MOISTURE AND AIR FLOW CONTROL DEVICE

Helen M. Torme, 3450 N. Lake Shore Dr., Chicago, Ill. 60657

Filed Aug. 10, 1981, Ser. No. 291,792

Int. Cl.³ E06B *7/12*

U.S. Cl. 52—171 **8 Claims**



1. In a window structure having a sash and a sill, said sash and sill having moisture liquid produced thereon as a result of climatic conditions, and said sash and sill cooperatively defining at times a crack therebetween, the improvement comprising:

a moisture and air flow control device comprising a block of liquid absorbing material; and

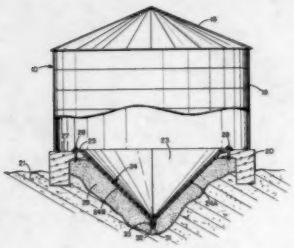
wicking means enclosing said block defining outwardly exposed means for conducting moisture liquid from said sash and sill by wicking action to said block through a portion of the wicking means engaging the sash and sill, and from said block through a portion of the wicking means spaced from said sash and sill, effectively over the entire outer surface of the block, said wicking means being flexible and further defining means for blocking air flow through said crack as a result of the crack being covered by said device.

4,408,426

STORAGE BIN FLOOR STRUCTURE

Stuart Ystebo, 2421 - 16th Ave. South, Moorehead, Minn. 56560

Filed Aug. 3, 1981, Ser. No. 289,277
Int. Cl.³ E04H *7/00*
U.S. Cl. 52—245 **10 Claims**



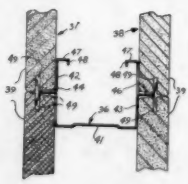
1. A bulk material storage facility comprising:
generally upright side walls defining a closed perimeter for containing a bulk material;
floor means conical in shape disposed within the perimeter defined by the side walls, said floor means including a modular conical member with downwardly convergent wall means converging toward an apex at an angle of at least 30° below a horizontal plane;
said floor means including a generally horizontal portion disposed adjacent the side walls in surrounding relationship to the modular member and of a width sufficient to permit passage by a person;
said modular conical member having an outwardly directed peripheral flange located at its upper edge and extending over the horizontal portion and including means assembling said peripheral flange to the horizontal portion.

4,408,427

FRAMING SYSTEM FOR DEMOUNTABLE WALLS OR THE LIKE

Gregory W. Zilch, Amherst, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Oct. 3, 1980, Ser. No. 193,803
Int. Cl.³ E04B *5/52*
U.S. Cl. 52—481 **19 Claims**



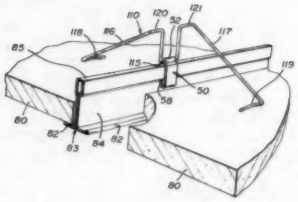
1. A frame member for supporting the abutting edges of kerfed edge wall panels at a location spaced from an adjacent wall structure, comprising a sheet metal member providing a backup surface means engageable with the inner side of said wall panels along the joints therebetween and at least one lateral leg joined to said backup surface means and extending at a substantial angle relative thereto to support said backup surface means and maintain it substantially straight, and a plurality of panel locking means at spaced locations along the length of said backup surface means, each locking means including a separate lateral portion extending substantially perpendicular to said backup surface means and a panel edge locking portion extending substantially parallel to said backup surface means, said locking portions being adapted to extend into the kerfs of panels along abutting edges thereof to secure said panels against said backup surface means, said locking portions extending from said lateral portion along an inner part substantially along a first plane spaced from and substantially parallel to said backup surface means to an outwardly extending step and from said step along an outer part, said outer part extending along a second plane substantially parallel to said backup surface means and spaced therefrom a distance greater than said first plane, whereby assembly of a panel kerf on said locking portion causes the panel to be cammed into proper engagement with said backup surface means as it moves past said step.

4,408,428

SUSPENDED PANEL CEILING HAVING IMPACT ABSORBENT PANEL RETAINING CLIP ASSEMBLIES

Michael E. Brooke, Sharon, Wis., and Alan C. Wendt, Barrington, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,751
Int. Cl.³ E04B *5/52*; E06B *3/54*
U.S. Cl. 52—489 **13 Claims**



1. A ceiling comprising:
a suspended grid of main runners and cross runners, said runners having a vertical web and horizontal flanges forming an inverted T in cross section, the webs of at least the cross runners having a lateral abutment;
a plurality of ceiling panels resting on said horizontal flanges;
a clinch fastener mounted on said web by resilient frictional engagement with said lateral abutment, said clinch fastener having two spaced-apart, upright straps, a channel continuous with and connecting said straps at the apex of said fastener, each strap having a keeper distal from said apex and extending inwardly and upwardly into the space therebetween, said channel and straps straddling the web and said keeper biting into said abutment, and
a spring having a central U-shaped segment having two upright arms and a cross member between said arms, said cross member being interposed co-axially within said channel, and divergent legs extending downward from the arms of the U at an acute angle to the vertical plane passing through both arms, said legs resting on the inner faces of adjacent panels.

4,408,429

PLUG FOR HOLES IN WALLS

Larry V. Neal, 1352 Burnside Ave., Apt. 6, Los Angeles, Calif. 90019

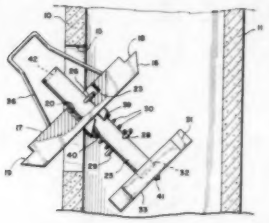
Filed Oct. 13, 1981, Ser. No. 310,434
Int. Cl.³ E04G *23/02*
U.S. Cl. 52—514 **4 Claims**

1. A plug for holes in walls made up of first and second wall panels on opposite sides of vertical studs including, in combination:
(a) a first body having a flat front surface with opposite stepped sides for engaging opposite inside marginal edges of a cut-out about a hole in the first wall panel so that the

first body extends within the cut-out, said first body further having a central opening with upper and lower slots at its rear exit end and arcuate cut-outs extending partially into its front entrance end communicating with said slots and defining diametrically opposite internal ledges;

(b) a shaft having a first pair of diametrically oppositely extending pins at a given spacing from one end such that said one end and pins can be received in said central opening and slots from the rear to protrude out the front of said first body and rotated to seat said first pair of pins on said internal ledges said shaft having a second pair of diametrically oppositely extending pins at a given spacing from its other end;

(c) a compression spring surrounding said shaft between the first and second pairs of pins such that when the first pair of pins enters the slots, the spring bears against the rear periphery of the central opening and is compressed as the



one end of the shaft is received in the opening, the spring thereby exerting a biasing force on the shaft tending to urge the shaft out of the central opening, the first pair of pins when seated on the ledges holding the shaft in the opening; and

(d) a second body having a front central circular cavity receiving said other end of said shaft and a flat rear surface in a spaced position juxtaposed the inside surface of the second wall panel when said first body is in said cut-out of the first wall panel and the pins seated on the ledges whereby rotation of the protruding one end of the shaft to unseat the pins results in the spring urging the shaft toward the second wall panel to seat the second member against the second wall and thereby hold the first member in place so that the cut-out is plugged, further rotation of the shaft positioning the first pins cross-wise of the slots to lock the relative positions of the first and second bodies in place.

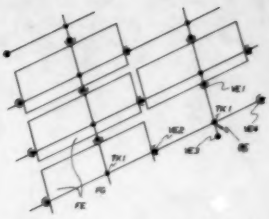
4,408,430

CONSTRUCTION ELEMENTS AND JOINT CONNECTIONS FOR A DEFORMABLE STRUCTURE AS WELL AS DEFORMABLE LINE, PLANE AND THREE-DIMENSIONAL STRUCTURES

Alfred Wangler, Lettenweg 3, 7889 Grenzach-Wyhlen, and Otto K. Fiedler, Rheinhohe 9, 7891 Kussaberg 1, both of Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,654
Int. Cl.³ E04D *1/00*
U.S. Cl. 52—585 **13 Claims**

1. An apparatus comprising a plurality of construction elements of a deformable line, surface or a three-dimensional structure, a connection element joining two of said construction elements and connected with said construction elements and providing for relative motion between said construction elements, each of said construction elements having an opening therein for removably receiving said connection element, a spring element located within said opening for detachably retaining said connection element within said opening, said spring element including a first surface section and at least one flexible spring section engaging said connection element, and



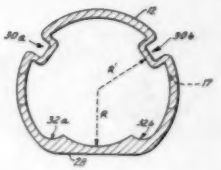
means for joining said first surface section of said spring element to its respective construction element.

4,408,431

SHORING EQUIPMENT

Michael S. D'Alessio, Flushing, and Stanley A. Sandler, New York, both of N.Y., assignors to Harsco Corporation, Camp Hill, Pa.

Filed Jan. 15, 1981, Ser. No. 225,204
Int. Cl.³ E04G *1/06, 1/22*; E04H *12/08*
U.S. Cl. 52—690 **18 Claims**



1. An improved shoring, scaffolding, or similar support frame made of relatively thin-walled extruded light weight metal tubing comprising at least a pair of parallel legs, fixed bracing means between said legs, each said leg being substantially circular in cross section with a longitudinally-extending planar-surfaced wall portion of a width to accommodate said bracing means and at least two longitudinally-extending internal ribs, the minimum inside radius of said leg to said planar wall portion and to each of said ribs being substantially the same and defining a circle which accommodates cylindrical accessories of a predetermined size, said ribs being substantially symmetrically spaced about the circumference of said leg relative to said wall portion sufficiently to contain each said accessory against lateral displacement and maintain it in longitudinal alignment, and said fixed bracing means being fixed to and between the respective planar-surfaced wall portions of said pair of legs.

4,408,432

TRIM STRIP ASSEMBLY

Gordon V. Carter, and Ralph D. Tromble, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

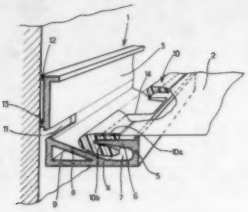
Filed Aug. 16, 1982, Ser. No. 408,385
Int. Cl.³ E04C *2/38*
U.S. Cl. 52—718 **6 Claims**

1. A trim strip assembly attached to a substrate body comprising:

an elongated, rigid member fastened to the substrate body, said rigid member having a terminal end with spaced upturned tabs;

a trim strip secured to the rigid member, said trim strip having two parallel longitudinal downwardly curved elongated areas and a terminal end; and

an end cap secured to the rigid member and trim strip having a forward terminal end, a top wall, and a rear wall, the bottom edge of which abuts the end of the rigid member, said end cap having two spaced flat resilient legs projecting from the rear wall and their forward ends extending beyond the forward terminal end and each leg in contact



with a respective longitudinal downwardly curved elongated area of the trim strip, each leg being spaced from the top wall to allow insertion under the terminal end of the trim strip and each leg lies in a plane that bisects the other and at the same acute angle relative to the horizontal plane, said legs each having a cutout portion at the rear to receive the respective upturned tabs of the rigid member.

4,408,433

SECTION CONSTITUTING AN OUTER LONGITUDINAL ELEMENT OR MOULDING OF A FALSE CEILING OR A FALSE WALL

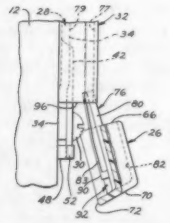
Fernand Scherrer, 2, rue Georges Bizet, 68170 Rixheim, France

Filed Feb. 3, 1981, Ser. No. 231,101

Claims priority, application France, Feb. 5, 1980, 80 02438

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—738 **8 Claims**



1. A frame for a false ceiling or false wall, comprising

a first flange adapted to be attached to the edges of a wall;

a second flange angularly related to said first flange;

said second flange terminating in a shoulder extending towards said first flange;

said shoulder defining with said second flange a generally U-shaped groove open towards said first flange and adapted to receive therein a hook-shaped portion of the rigid edge of a sheet;

said second flange including a prismatic tubular part having a triangular cross-section;

said part having a sloping surface leading from said first flange to said groove and defining with said shoulder a passage having a width slightly greater than the thickness of said hook-shaped portion of said edge to hold said portion and prevent deformation thereof;

said first flange having openings above said sloping surface; and

spaced longitudinal ribs outwardly extending from said first flange, one of said ribs forming the end of said first flange and having an inwardly extending portion parallel to said second flange.

4,408,434

MULTI-STOREY BUILDING AND A PREFABRICATED PANEL FOR SUCH A BUILDING

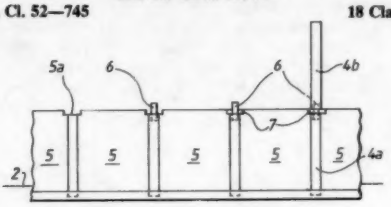
Leonard D. Collins, 28 Wychelm Rd., Hornchurch, Essex, England

Filed Jan. 7, 1981, Ser. No. 223,061

Claims priority, application United Kingdom, Jun. 19, 1979, 7921241; Jun. 19, 1979, 7921242; Dec. 6, 1979, 7942216

Int. Cl.³ E04G *21/14*

U.S. Cl. 52—745 **18 Claims**



1. A method of constructing a multi-storey building comprising the steps of laying a foundation for the external walls of the building, erecting a plurality of ground floor columns around the foundation, the ground floor columns being supported by the foundation and extending over substantially the height of the ground floor of the building, placing panels between the adjacent pairs of ground floor columns to form the external walls of the ground floor storey of the building, and constructing the higher storeys of the building successively one upon another, wherein each of the higher storeys is contructed by erecting a plurality of columns around the building, each of said columns being supported by a respective column of the storey immediately below and extending over substantially the height of that storey, by firmly clamping the wall panels of the storey immediately below in position, by then supporting a floor on the upper edges of the wall panels of the storey immediately below, and then by placing panels between the adjacent pairs of said columns to form the external walls of that storey, the uppermost storey of the building being covered by a roof which is supported on the upper edges of the wall panels of that storey.

4,408,435

WRAPPING MACHINES

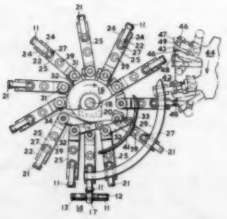
Leonard Sutton, Gainsborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed Dec. 29, 1980, Ser. No. 220,439

Claims priority, application United Kingdom, Feb. 14, 1980, 8004912

Int. Cl.³ B65B *11/32*

U.S. Cl. 53—225 **6 Claims**



1. A sweet wrapping machine, which comprises a horizon-

tally continuously moving infeed conveyor for supplying a continuous procession of regularly pitched sweets, a vertically moving continuously operating elevator mechanism for lifting the sweets individually and in succession from the infeed conveyor, a continuously rotating wrapping wheel having pairs of sweet receiving jaws which are equally spaced at a pitch greater than that of the sweets on the infeed conveyor, a continuously rotating transfer wheel disposed above the infeed conveyor between the infeed conveyor and the wrapping wheel and including a number of radially extending arms, each of which carries a pair of sweet receiving jaws and a trapper plunger which cooperates with the elevator mechanism to trap each sweet lifted thereby into said pair of sweet-receiving jaws, the arms moving in a path between a first transfer station at which the jaws receive successive sweets from the elevator mechanism and a second transfer station at which the sweets are transferred in succession to the jaws of the wrapping wheel, means for periodically opening and closing the pairs of jaws on the transfer wheel, each of said pair of jaws opening to receive at the first transfer station a sweet lifted into said jaws by the elevator mechanism in cooperation with a transfer plunger, then closing to embrace the sweet and opening again on arrival of said pair of jaws at the second transfer station, means for imparting opening and closing movement to the jaws on the wrapping wheel in a direction perpendicular to the opening and closing movement of the jaws on the transfer wheel, each pair of jaws on the wrapping wheel closing at the second transfer station to seize a sweet from a pair of jaws on the transfer wheel at the moment of opening of said jaws on the transfer wheel, gripper means arranged to advance a wrapper into position to be partially folded around each sweet as it is transferred to a pair of jaws on the wrapping wheel, means for releasing the wrapper from said gripper means at the moment of transfer of said sweet, and means for shifting the arms during rotation of the transfer wheel so that they approach the first transfer station pitched circumferentially at the same spacing as the sweets on the infeed conveyor and approach the second transfer station at the same circumferential spacing as the pairs of jaws on the wrapping wheel.

4,408,436

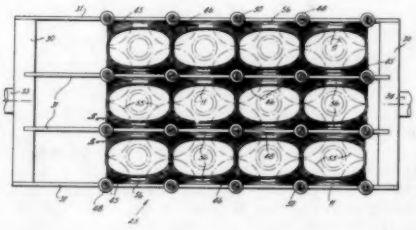
CASE PACKER FOR INVERTING BOTTLES AND DEPOSITING THEM IN A CASE

Charles G. Glover, Cincinnati, Ohio, assignor to The Lodge & Shipley Company, Cincinnati, Ohio

Filed May 22, 1981, Ser. No. 266,511

Int. Cl.³ B65B *39/00, 5/08*

U.S. Cl. 53—247 **3 Claims**



1. In a case packer apparatus for loading bottles upside down in a case comprising,

a grid,

means for marshalling a pattern of bottles on said grid,

means for positioning a case below said grid,

a bottle rotator located below said grid for receiving a pattern of bottles and rotating said pattern of bottles through 180° to turn them upside down,

bottle gripping means normally located above said grid and adapted to grasp bottles marshalled on said grid and lower them through said grid into said rotator,

dividers creating a plurality of pockets in said rotator,

bristles lining at least a portion of said dividers and creating a space within said pockets substantially smaller than the outside dimension of each bottle, whereby bottles positioned in said rotator will be frictionally retained after being released by said bottle-gripping means,

said bottle gripping means forcing earlier positioned bottles through said rotator and into said case while positioning a fresh pattern of bottles in said rotator.

4,408,437

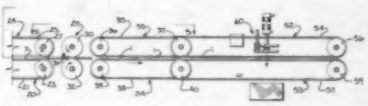
METHOD AND APPARATUS FOR PRODUCING LIQUID IMPREGNATED FABRIC WIPES

Bill W. Crouch, Brown Deer; William F. Sauer, Sussex, and Kenneth R. Zylka, Grafton, all of Wis., assignors to Meridian Industries, Inc., Milwaukee, Wis.

Filed Sep. 28, 1981, Ser. No. 306,169

Int. Cl.³ B65B *63/00*

U.S. Cl. 53—431 **19 Claims**



18. A method of producing liquid impregnated wipes, comprising the steps of continuously passing a sheet of absorbent material over a liquid impregnating tube having a liquid dispensing slot extending longitudingally of said tube, discharging a liquid impregnant through said slot into contact with said sheet to thereby impregnate said sheet with the liquid, cutting the impregnated sheet into desired lengths to form a plurality of wipes, transporting the wipes by engaging the side edges of each wipe between two cooperating pairs of spaced moving endless belts while maintaining the central portion of each wipe unsupported, and moving a plunger downwardly within the space between said pairs of cooperating belts to thereby eject the wipes from engagement with said belts and deposit said wipes into a container.

4,408,438

PROCESS AND APPARATUS FOR PRESSING, PACKING AND HOOPING FIBROUS MATERIAL IN BALE FORM

Siegfried Rewitzer, Ihrlerstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 210,372

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948237

Int. Cl.³ B65B *63/02*

U.S. Cl. 53—438 **11 Claims**

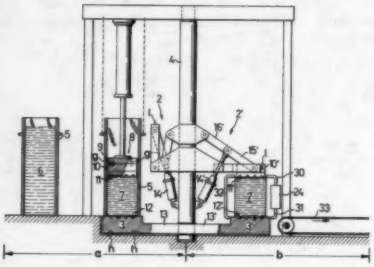
1. Process for pressing fibrous material in bale form in a final press and for subsequently packing and hooping these bales, comprising the steps of

(a) covering pressing faces of a press-ram and of a bottom plate of the final press with blanks of flexible sheet-like packing material which project beyond the pressing faces and are held in this position, and thereafter introducing

already prepressed fibrous material into the final press between said blanks and pressing the material;

(b) after the pressing operation, removing side walls of a press box of the press from the fibrous material, while the press maintains the bale of material under applied pressure, far enough to enable a holding device to receive the pressed bale including the end piece of the press-ram and the bottom plate;

(c) receiving the pressed bale including the press-ram end piece and bottom plate by means of the holding device and moving the same on a predetermined path out of the pressing region to further working positions, with the pressed height of the bale being allowed to increase at most slightly;



(d) subsequently automatically bending projecting areas of the blanks of packing material onto the side faces of the bale by means of holding-down or turning-in devices and holding the bent-down areas in this position;

(e) then reinforcing the bale with hooping means;

(f) subsequently, by opening the holding device, increasing the distance between the press-ram end piece and bottom plate so that the bale is released to be transported away; and

(g) returning the press-ram end piece and bottom plate thereafter into the pressing region by means of the holding device.

4,408,439

METHOD AND APPARATUS FOR WRAPPING AN ARTICLE

Andrew W. Anderson, West Caldwell, N.J., assignor to Scandia Packaging Machinery Company, Clifton, N.J.

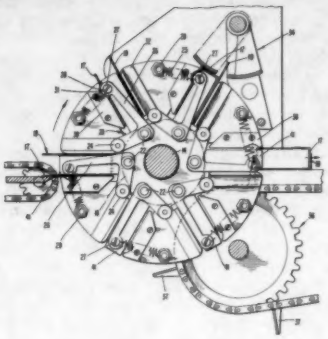
Filed Feb. 19, 1981, Ser. No. 235,367
Int. Cl.³ B65B *11/42, 53/02*
U.S. Cl. 53—461 **22 Claims**

1. A method of wrapping an article, said method comprising the steps of:

(a) wrapping a sheet of thin, flexible wrapping material around said article to form at least one end portion including a free edge of the sheet and at least one side portion, said end and side portions projecting outwardly from said article,

(b) providing a shaped backing means having a shaped supporting surface adjacent one surface of said projecting side portion and a pushing member adjacent the other surface of said projecting side portion,

(c) pushing against said other surface with said pushing member to form a projecting, flexible excess portion in said projecting side portion against the shaped supporting surface while positioned around the article, and then



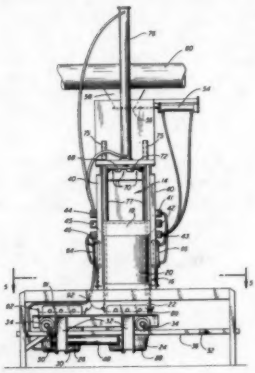
(d) folding said end and side portions onto the article while maintaining the excess portion in the wrapping material thereby forming a loosely wrapped article.

4,408,440

APPARATUS FOR PACKING AND COMPRESSING FRESH SPINACH, OR THE LIKE

John Van Kesteren, Jr., P.O. Box 487, Onancock, Va. 23417

Filed Aug. 6, 1981, Ser. No. 290,541
Int. Cl.³ B65B *1/24*
U.S. Cl. 53—527 **14 Claims**



1. Apparatus for assisting in packing compressible, leafy vegetables, or the like, into covered containers, said apparatus comprising:

(a) means for supporting an open-topped container with its upper end at a first location;

(b) hollow guide means having a cross section substantially corresponding to that of said container upper end and extending upwardly from a position immediately above said first location to guide said vegetables deposited into said guide means to said container;

(c) plunger means movable through said guide means between a first position above said guide means and a second position immediately above the open top of said container at said first location, whereby downward travel of said plunger means serves to compress said vegetables within said container and guide means into the volume of said container;

(d) retainer means movable between a first position laterally

adjacent said open top of said container at said first location and a second position in contacting and partial covering relation to said compressed vegetables in said container with said plunger means in its second position, said retainer means being effective to retain said compressed vegetables within said container to allow placing a cover thereon after movement of said plunger means back to said first position thereof and prior to movement of said retainer means back to its first position;

said guide means including a movable portion forming the lower end thereof, said portion being movable between a lower position immediately adjacent the upper end of a container at said first location, wherein said portion is in the path of movement of said retainer means, and an upper position out of the path of movement of said retainer means; and

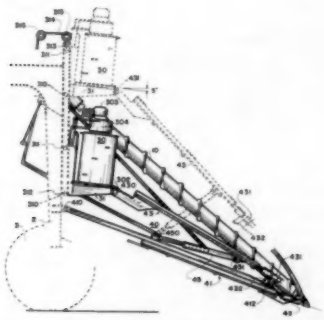
(f) means operable to move said plunger means and said retainer means between said first and second positions of each.

4,408,441

INTERCONNECTED, ADJUSTABLE HEIGHT TOPPER AND GATHERING ARM SYSTEM FOR SUGAR CANE HARVESTERS, ETC.

Harold A. Willett, Thibodaux, La., assignor to Cameco Industries, Inc., Thibodaux, La.

Filed Jan. 27, 1982, Ser. No. 343,212
Int. Cl.³ A01D *45/10*
U.S. Cl. 56—14.3 **6 Claims**



1. A cane harvester, having a topper section and cane gathering arms at its front end, comprising

a main frame;

topper section means having a rotatable cutter for cutting the tops of the cane;

a set of vertical tracks fixedly mounted on said frame;

a vertically moveable base carrying said topper section means mounted on said vertical tracks for vertical movement up and down said tracks, varying the cutter height of said topper section means; and

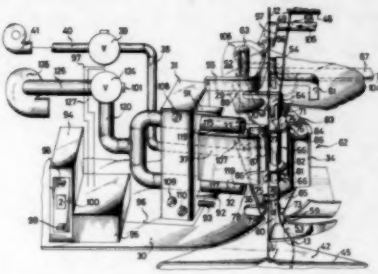
topper cane gathering arm means extending out and down from the front of said main frame for gathering up the cane being harvested and bringing it to said topper section for topping, the harvester end of said cane gathering arm means being pivotally connected to said base and topper section means for combined vertical movement with said base and topper section means, said topper section means and said cane gathering arm means being vertically moveable together for height adjustment of said topper section without significantly varying the angle of cut of said rotatable cutter.

4,408,442

METHOD AND DEVICE FOR JOINING AN UPPER THREAD TO A LOWER THREAD

Joachim Rohner, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,280
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945504
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 **10 Claims**



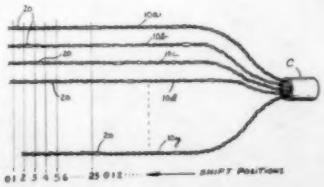
1. Method for joining an upper thread with a lower thread, which comprises moving at least one thread regulator from a thread receiving position to a thread delivery position, inserting the threads with the at least one thread regulator into a longitudinal groove formed in a splicing chamber, automatically admitting compressed air laterally into the splicing chamber for splicing the threads, automatically separating the ends of the upper and lower threads and blowing compressed air into the splicing chamber in dependence on the position of the at least one thread regulator, separating the threads to form new shorter thread ends, sucking up and securing the newly-formed shorter thread ends with an air stream above and below said splicing chamber, interchanging twisting nozzles above and below the splicing chamber for directing the air stream along the newly-formed shorter thread ends in the form of a twisting flow above and below the splicing chamber against the direction of twist of the particular threads being joined, and coordinating the strength and duration of the air stream with the strength, type and condition of the threads to be joined together.

4,408,443

TELECOMMUNICATIONS CABLE AND METHOD OF MAKING SAME

Robert J. Brown, Lawrenceville, and Clyde J. Lever, Jr., Norcross, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,524
Int. Cl.³ H01B *13/04*; D07B *3/00*
U.S. Cl. 57—204 **7 Claims**



1. A telecommunications cable comprised of more than five S-Z twisted wire pairs having their twist reversals longitudi-

nally staggered in a repetitive sequence of 1 to N, where N is an integer, longitudinally spaced positions, and with said wires bundled together with any adjacent wire pairs having their twist reversals non-overlapped and staggered by no more than N/2 positions to limit S to Z coupling.

4,408,444

STEEL CORD FOR REINFORCEMENT OF ELASTOMER MATERIAL

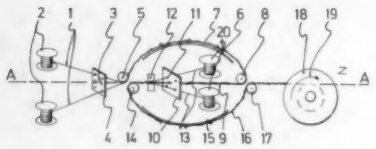
Freddy Baillievier, Zwevegem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Apr. 26, 1982, Ser. No. 371,722

Claims priority, application Netherlands, May 8, 1981, 8102273

Int. Cl.³ D07B *1/00*; D02G *3/48*

U.S. Cl. 57—237 **4 Claims**



1. A steel cord adapted for the reinforcement of elastomer material, comprising two equivalent wire groups of at least two wires each, the wire groups being twisted around each other and forming helicoids of a same pitch and substantially same form, the wires of the first group having a twist pitch that differs from the pitch of said helicoids, and has a value of more than 300 mm, characterized by the fact that the twist pitch of the second group is in the same sense and has the same value as the pitch of said helicoids.

4,408,445

TWISTED SINGLES APPAREL YARN

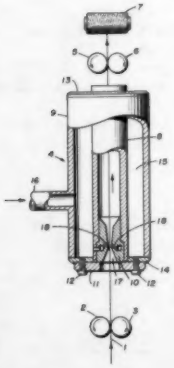
Arnold E. Wilkie, Pensacola Beach, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 71,460, Aug. 3, 1979, Pat. No. 4,290,378. This application Sep. 14, 1981, Ser. No. 301,717

The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.³ D02J *1/08*; D02G *3/26*

U.S. Cl. 57—246 **15 Claims**



1. A tangled yarn, said yarn being a bulky, loopy twisted apparel singles yarn and being characterized in having a bundle twist of 2 to 15 turns per inch and a lateral coherency of 0.5 to 15 cm.

4,408,446

SINGLES CARPET YARN

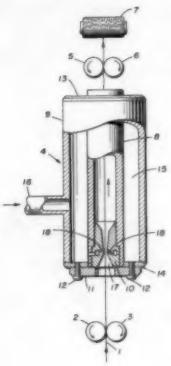
Arnold E. Wilkie, Pensacola Beach, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 71,460, Aug. 3, 1979, Pat. No. 4,290,378. This application Sep. 18, 1981, Ser. No. 303,655

The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.³ D02J *1/08*; D02G *3/26*

U.S. Cl. 57—246 **26 Claims**



1. A bulky, heatset, singles carpet yarn, said yarn having a bundle twist of 0.5 to 8.0 turns per inch (19.7 to 236.2 turns per meter) and sufficient tangle to provide a lateral coherency ranging from 0.25 to less than 1.0 cm, wherein said tangle has been imparted to the yarn after said bundle twist.

4,408,447

METHOD OF AND SYSTEM FOR CONTROLLING THE OPERATION OF OPEN-END SPINNING MACHINES

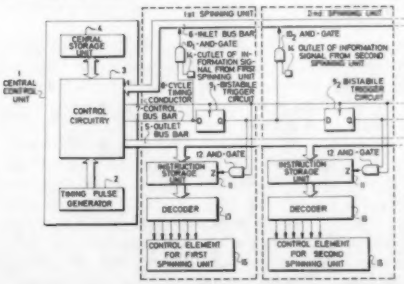
Jiri Sloupensky, and Miloslav Tyl, both of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Continuation-in-part of Ser. No. 72,893, Sep. 6, 1979. This application Apr. 16, 1981, Ser. No. 254,756

Claims priority, application Czechoslovakia, Sep. 6, 1978, 5765-78

Int. Cl.³ G06F *3/04*

U.S. Cl. 57—263 **5 Claims**



1. In a method of controlling open-end spinning machines

having a plurality of spinning units, each comprising a sliver supply device, a spinning rotor, a yarn take-off device, a spooling device and a device for remedying thread breakages, the last-mentioned comprising rotor cleaning and yarn spinning-in means, the operation of the individual spinning units being controlled by a central control unit, the improvement wherein the operation of all the spinning units, in both a normal spinning process and a process of remedying thread breakages, is entirely controlled by the central control unit within successive control cycles the time of duration of which is shorter than the minimum response time of executive members of the spinning unit, by control signals generated on the basis of evaluation of at least one of the information signals from the just controlled spinning unit and on the basis of sequence of programmed thread breakage remedying steps from a central storage unit of the central control unit, said control signals controlling the operation of the executive members of the spinning unit within a time interval between two subsequent control cycles while within the period of communication between the central control unit and the respective spinning unit, the other spinning units performing the operation determined by the last received instruction the validity of which lasts for the time of the control cycle, irrespective of any change in the information signal within the time interval between the two subsequent control cycles.

4,408,448

YARN FALSE TWISTING METHOD AND APPARATUS

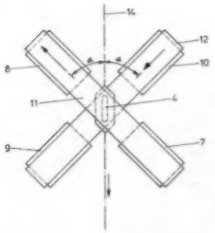
Karl Bauer; Peter Dammann, both of Remscheid; Hermann Kubler, Remscheid-Lüttringhausen, and Hellmut Lorenz, Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,217

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033683

Int. Cl.³ D02G *1/04;* D01H *7/92*

U.S. Cl. 57—336 **8 Claims**



1. A method of false twisting a yarn characterized by the ability to impart a desired twist to a running yarn under optimal tension conditions, and comprising the steps of

rotating a pair of endless belts mounted in crossing relation with the opposing surfaces disposed in opposing, substantially non-contacting relationship so as to define a twisting zone between the opposing surfaces thereof, while

advancing a yarn at a speed (Y) along a path of travel through said twisting zone,

locally biasing at least one of said belts toward the other belt at said twisting zone so as to have twist imparted to the advancing yarn by the frictional contact between the yarn and opposed surfaces, and with the biasing force being substantially limited to an area which is coincident to the path of the running yarn,

adjusting the relative orientation of the belts such that the acute angle (alpha) formed between each belt and the yarn path of travel substantially corresponds to the desired twist angle of the yarn in the twisted condition, and

adjusting the speed of each belt (B) according to the formula

$$B = \frac{Y}{\text{Cosine alpha}} \times (1 \pm 20\%).$$

4,408,449

FRICTION FALSE TWISTING APPARATUS

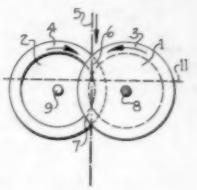
Karl Bauer; Heinz Schippers, and Peter Dammann, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 168,734, Jul. 14, 1980, Pat. No. 4,339,915. This application Jun. 12, 1981, Ser. No. 272,936

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023887

Int. Cl.³ D02G *1/08;* D01H *7/92*

U.S. Cl. 57—340 **10 Claims**



1. A yarn false twisting apparatus comprising

a pair of twist imparting members, with each member including a yarn engaging friction surface, and at least one of said members comprising a readily flexible circular disc mounted on a supporting shaft,

means rotatably mounting said twist imparting members such that portions of the respective yarn engaging friction surfaces are disposed in opposing, face to face relationship and define a twisting zone therebetween, and with at least that portion of said flexible disc which includes said friction surface being resiliently deflected from its normal plane of rotation at said twisting zone by its engagement with the friction surface of the other member or a yarn passing therebetween, and

drive means for operatively rotating each of said twist imparting members about their respective axes,

whereby a yarn may be continuously advanced through said twisting zone while having twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces.

4,408,450

REPAIR OR REPLACEMENT LINK

Jorgen O. Bernt, 1357 Amber Crescent, Oakville, Ontario, Canada

Filed Aug. 31, 1981, Ser. No. 297,742

Int. Cl.³ F16G *13/06*

U.S. Cl. 59—88 **14 Claims**

1. Chain link comprising:

two link portions desinged to interfit to provide a complete link,

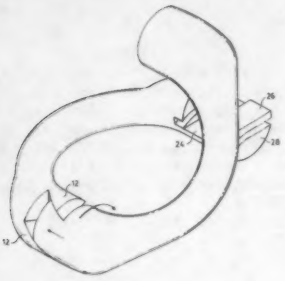
each link portion comprising a general U-shape terminating in two free ends extending in substantially the same direction,

one free end of one link being provided with grooves helical with respect to the centre line of the link,

a free end of the other link being provided with helical spline members substantially complementary to said helical grooves and designed to be inserted therein on the twisting and advancement of one of said portions relative to the other,

the other free ends of the respective links being designed to overlap, in a complementary manner on said twisting and advancement of the other ends,

said other free ends proving, on overlapping in response to said advancement and twisting, a pair of mutually facing



surfaces on said respective members preventing movement of one of said ends away from the other, and,

means used on cooperation with said other free ends in their interfitted position for preventing such other free ends from rotating to allow separation of said other free ends.

4,408,451

ROTATING JOINT FOR AN EXHAUST PIPE OF AN AUTOMOBILE VEHICLE

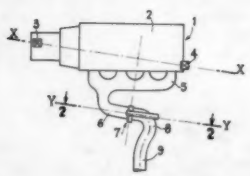
Jacques Sigwald, Frepillon, and Claude Lesueur, Argenteuil, both of France, assignors to Automobiles Peugeot and Automobiles Citroen, both of, France

Filed Jul. 15, 1982, Ser. No. 398,342

Claims priority, application France, Jul. 29, 1981, 81 14729

Int. Cl.³ F01N *7/00*

U.S. Cl. 60—322 **7 Claims**



1. A rotating joint in combination with two pipe elements of an exhaust pipe, and an internal combustion engine of an automobile vehicle connected to the exhaust pipe, said engine being mounted on suspension means to be pivotable about an axis, said joint comprising two coaxial rings, each ring being rigid with a respective one of the two pipe elements, each ring defining a rubbing surface contained in a plane perpendicular to said axis, and means for biasing said two surfaces toward each other.

4,408,452

PUMPING-UP HYDROELECTRIC POWER PLANTS

Sachio Tsunoda, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

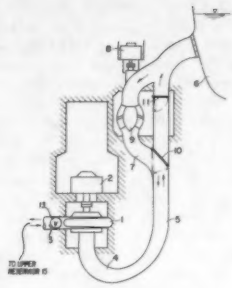
Filed Dec. 2, 1980, Ser. No. 212,145

Claims priority, application Japan, Dec. 28, 1979, 54-173295

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—398 **3 Claims**

1. In a pumping-up hydroelectric power plant comprising a single speed reversible pump/turbine operable as a pump at a constant speed between an upper reservoir and a lower reservoir, and a booster pump provided in a water passage of the single speed reversible pump/turbine to be operable in series therewith only when the pump/turbine is operated as a pump, the improvement comprising a driving device directly coupled with said booster pump for driving the same at a variable speed, means for detecting water levels in said two reservoirs, means for providing a control signal corresponding to a difference between the water levels thus detected, and a control



device for controlling the rotating speed of said driving device in response to said control signal so that said pump/turbine is operated at its maximum pumping efficiency regardless of variations in the water levels in said two reservoirs.

4,408,453

HYDRAULIC CONTROL SYSTEM

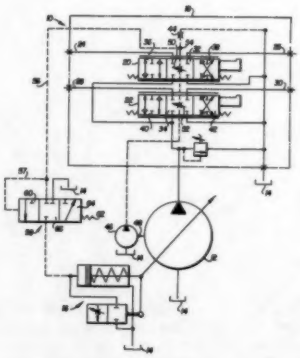
Robert C. Westveer, Kalamazoo, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 16, 1981, Ser. No. 225,815

The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—445 **7 Claims**



1. An improved hydraulic system, comprising:

a fluid reservoir;

a variable displacement pump having a fluid input in communication with said reservoir and having a fluid output;

fluid pressure actuated displacement control means for controlling the displacement of said pump;

a fluid actuated device;

control valve means in fluid communication with said fluid output and with said reservoir, for controlling a flow of fluid from said pump to said fluid actuated device;

means for producing a flow of signal fluid which is substantially isolated from pressure surges caused by said fluid actuated device;

means including said control valve for regulating said flow of signal fluid in response to movement of said control

valve means as it controls said flow of fluid from said pump to said fluid actuated device;

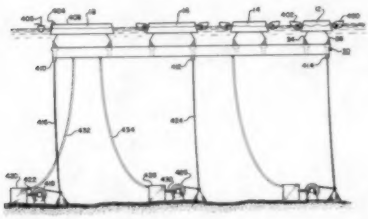
sensor valve means in fluid communication with an output of said regulating means, with said displacement control means and with said reservoir, for directing to said control means a portion of said signal fluid which is isolated from pressure surges caused by said fluid actuated device in response to variations in the pressure of said signal fluid at said output, whereby flow of said signal fluid and displacement of said pump are controlled in accordance with the flow rate selected for said fluid actuated device at said control valve means but are substantially unaffected by pressure surges caused by said fluid actuated device.

4,408,454

FLUID COUPLED WAVE GENERATOR ARRAY WITH SUBSEA STRUCTURE

Glenn E. Hagen, and Carroll K. Gordon, both of New Orleans, La., assignors to Sea Energy Corporation, New Orleans, La.

Filed Jul. 21, 1980, Ser. No. 169,510
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—500 **5 Claims**



1. A wave power extraction system for operation on the ocean comprising:

a plurality of floats, each said float being sized and positioned to form a Hagen array when they are on the ocean's surface, said Hagen array being an arrangement of differing sized floats adapted to allow relative motion between adjacent floats so as to be responsive to both the amplitude spectrum and the wavelength spectrum of wave motion;

subsea structure means for supporting said Hagen array;

power extraction means connected to said floats in said Hagen array and to said subsea structure and responsive to the relative motion therebetween; and

anchoring means connected to said structure and to the sea floor for connecting said structure to the sea floor, said anchoring means includes an anchoring cable connected to said structure, and said anchoring means includes a subsea winch driven by a prime mover, said winch being capable of controllably reeling and unreeling said anchoring cable.

4,408,455

WAVE ACTION ENERGY GENERATING SYSTEM

Melville G. Montgomery, 2 Evergreen Rd., Severna Park, Md. 21146

Filed May 18, 1981, Ser. No. 264,682
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—505 **8 Claims**

1. An energy generating system using the forces of wave action of a body of water to generate energy, comprising:

a base means, said base means having a first side, a second side, and a top side, said base means being located at a body of water, said body of water being subject to wave action;

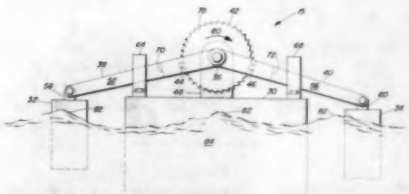
a first float means, said first float means being located in said body of water on said first side of said base means, said first float means being subject to said wave action of said body of water, said first float means being in close vicinity of said base means;

a shaft means;

a gear means, said gear means having a plurality of ratchet-like teeth thereon around the periphery of said gear means, said gear means being suitably affixed to said shaft means;

a first connecting means, said first connecting means consisting of a first member and a second member, said first and second members of said first connecting means being spaced apart, said first connecting means having a first end and a second end, said first end of said first connecting means being pivotably connected to said first float means, said second end of said connecting means being pivotably connected to said shaft means;

a first housing means, said first housing means being hollow, said first housing means having an aperture in one end thereof said first housing means being located between and affixed to said spaced apart first and second members of said first connecting means;



a first spring means, said first spring means being a compression-type spring, said first spring means located and confined within said hollow housing means;

a first pawl means, said first pawl means having a first end and a second end, said first pawl means being located within said hollow housing means, said first end of said first pawl means protruding through and from said aperture in said hollow housing means, said second end of said first pawl means being in contact with said first spring means, said first pawl means thereby being spring loaded within said first hollow housing means, said fist hollow housing means being suitably located and affixed to said first connecting means so as to orient and position said first end of said pawl means protruding from said aperture in said holding means for proper meshing and operation with said ratchet-like teeth; and

a support means, said support means being located upon said top side of and affixed to said base means, said support means supporting said shaft means.

4,408,456

FREE-PISTON STIRLING ENGINE POWER CONTROL

Jeffrey S. Rauch, Latham, N.Y., assignor to Mechanical Technolgy Incorporated, Latham, N.Y.

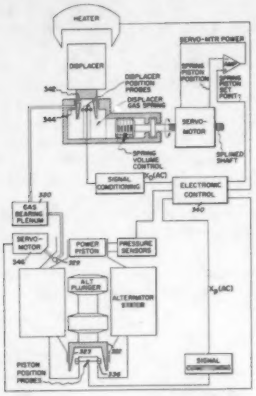
Filed Jul. 14, 1980, Ser. No. 168,716
Int. Cl.³ F02G *1/06*
U.S. Cl. 60—518 **31 Claims**

1. In a Stirling engine having a vessel enclosing a charge of working gas in a working space heated by a heater at one end and cooled by a cooler at the other end, and containing a displacer piston which reciprocates axially in the working space to shuttle the working gas between the heater and cooler to generate a periodic pressure wave in the working gas which drives a power piston for axial reciprocation in the vessel, the improvement comprising:

a tapered surface on one of said pistons, said surface forming a small angle with the direction of movement of said one piston;

a proximity sensor closely spaced from said tapered surface

and having a sensing surface facing said tapered surface for sensing the width of the gap between said sensing surface and said tapered surface;



whereby each axial position of said one piston has a corresponding unique gap between said sensing surface and said tapered surface which gap can be measured by said proximity sensor and related to the axial position of said one piston.

4,408,457

MECHANICALLY CONTROLLABLE BRAKE BOOSTER

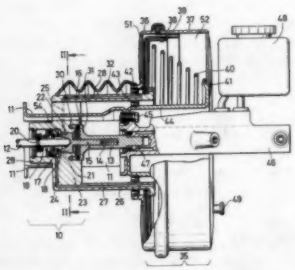
Hans-Henning Luepertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,541

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012455

Int. Cl.³ B60T *13/00*; **F15B** *9/10*; **F01B** *31/00*

U.S. Cl. 60—547.1 **45 Claims**



1. A mechanically controlled brake booster for automotive vehicles comprising:

a pressure casing including at least one boosting piston disposed therein to subdivide said casing into a low-pressure chamber and a working chamber, said piston acting via a connecting member and a reaction device on a push rod operatively associated with a master cylinder, said casing being in the form of a ring having an outer periphery and an inner periphery encircling said master cylinder, said casing having said inner periphery fastened to said master cylinder;

a control rod operatively connected to said reaction device to actuate a valve controlling pressure in said working chamber;

webs connected to and extending axially from said inner periphery of said casing beyond one lateral wall thereof, said webs securing said casing to a vehicle splashboard; and

said connecting member includes

at least one transmission member disposed parallel to said webs, and

a yoke attached to said transmission member, said yoke extending radially through said webs.

4,408,458

ELECTRIC POWER GENERATING SYSTEM

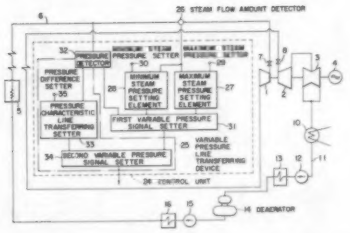
Akiomi Torii, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 15, 1981, Ser. No. 283,619

Claims priority, application Japan, Jul. 29, 1980, 55-104083

Int. Cl.³ F01K *13/02*

U.S. Cl. 60—660 **3 Claims**


25 STEAM FLOW AMOUNT DETECTOR
PRESSURE DIFFERENCE SETTER
MINIMUM STEAM PRESSURE SETTING ELEMENT
MAXIMUM STEAM PRESSURE SETTING ELEMENT
PRESSURE CHARACTERISTIC LINE TRANSFERRING SETTER
FIRST VARIABLE PRESSURE SIGNAL SETTER
SECOND VARIABLE PRESSURE SIGNAL SETTER
VARIABLE PRESSURE LINE TRANSFERRING DEVICE
26 CONTROL UNIT
16 DEAERATOR

1. In an electric power generating system capable of absorbing a variable load of the type comprising a boiler, a steam turbine, an electric generator driven by said turbine, said boiler and said turbine being interconnected through a steam conduit including a control valve which adjusts the flow amount of the steam in said steam conduit, and a variable pressure operation control device which maintains a constant degree of opening of said control valve at a time when a steam pressure in said steam conduit lies in a range between predetermined pressure values, the improvement in which said variable pressure operation control device comprises means for comparing an actual steam pressure in said steam conduit with a pressure predetermined in accordance with variation of a load of said generator for generating a signal to determine a variable pressure operation characteristic line for changing the degree of opening of said control valve in response to a difference between said compared pressures.

4,408,459

HEAT STORAGE POND AND POWER PLANT USING SAME

Amnon Yogev, c/o Hoffman & Sandler, 2361 Jeff Davis Hwy., Arlington, Va. 22202

Continuation of Ser. No. 899,815, Apr. 25, 1978, abandoned. This application Jan. 23, 1981, Ser. No. 227,743

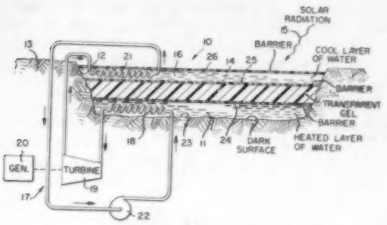
Claims priority, application United Kingdom, May 9, 1977, 19401/77

Int. Cl.³ F03G *7/02*

U.S. Cl. 60—641.8 **22 Claims**

1. A heat storage pond comprising a heat storage liquid which receives heat and is raised to a temperature higher than that of an ambient medium, an insulating layer of gel that floats

on the liquid and is thick engough to thermally insulate the latter against significant conductive heat loss to the ambient



medium above the insulating layer, wherein the gel is non-aqueous and is produced from a hydrocarbon liquid.

4,408,460

HEATING SYSTEM FOR A STEAM TURBINE ENERGY PRODUCING PLANT

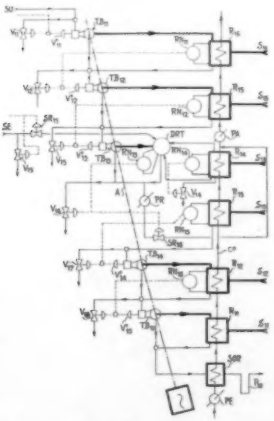
Andre J. Paquet, Brussels, Belgium, assignor to Hamon-Sobelco, S.A., Brussels, Belgium

Filed Oct. 21, 1980, Ser. No. 199,193

Claims priority, application European Pat. Off., Jan. 18, 1980, 80400077.6

Int. Cl.³ F01K 7/34

U.S. Cl. 60—678 **8 Claims**



1. A system for utilizing condensates of a steam turbine of an energy producing plant, comprising at least one condensation heat exchanger whose condensates are expanded toward a lower pressure exchanger, wherein said system comprises at least one biphase turbine disposed between said condensation heat exchanger and the lower pressure exchanger and fed with the condensates of said condensation heat exchanger.

4,408,461

COMBUSTION CHAMBER OF A GAS TURBINE WITH PRE-MIXING AND PRE-EVAPORATION ELEMENTS

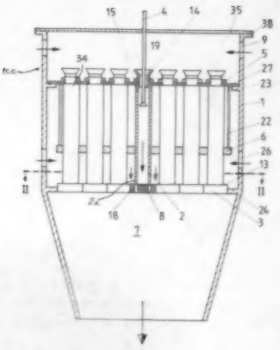
Eduard Brühwiler, Nussbaumen, and Hans Koch, Zurich, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Oct. 20, 1980, Ser. No. 198,929

Claims priority, application Switzerland, Nov. 23, 1979, 10444/79

Int. Cl.³ E02C 7/22

U.S. Cl. 60—737 **15 Claims**



1. A combustion compartment for a gas turbine comprising:

(a) a combustion compartment casing containing therein an air distributor chamber and a combustion chamber spatially separated from one another;

(b) a number of substantially tubular-shaped elements arranged between the air distribution chamber and the combustion chamber;

(c) nozzle means for infeeding a combustible medium to an end of said tubular-shaped elements located at the side of the air distributor chamber;

(d) the admixing and pre-evaporation of said combustible medium occurring within said plurality of tubular-shaped elements;

(e) each said tubular-shaped element having an end located at the side of the combustion chamber;

(f) at least one flame baffle for closing the end of the tubular-shaped elements located at the side of the combustion chamber, said flame baffle being provided with openings;

(g) at least one pilot element located between said tubular-shaped elements; and

(h) said combustible medium comprises fuel oil which is infed by said nozzle means and which is premixed and pre-evaporated within said tubular-shaped elements and admixed with compressed air with a large excess-air coefficient.

4,408,462

PRESSURE REGULATING DEVICE FOR USE IN AN AUTOMATIC TRANSMISSION

Shiro Sakakibara, Toyokawa; Shinobu Maseki, Anjo; Kazuaki Watanabe, and Isamu Minemoto, both of Toyota, all of Japan, assignors to Aisin Warner Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Sep. 8, 1980, Ser. No. 184,833

Claims priority, application Japan, Sep. 13, 1979, 54-118184

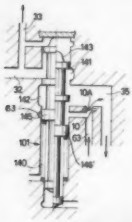
Int. Cl.³ F16H 41/04

U.S. Cl. 60—330 **6 Claims**

1. A pressure regulating device for use in a hydraulic control system for an automatic transmission, said hydraulic control system having a fluid pump and a reservoir for fluid supplied to the inlet of said pump, comprising:

a first pressure regulating valve for regulating the discharge pressure of fluid from said pump, said pump supplying a controlled line pressure to an hydraulic control circuit;

a second pressure regulating valve for regulating the fluid pressure of an excess portion of said fluid supplied to said hydraulic control system, said excess fluid being supplied at regulated pressure to a torque convertor, said second pressure regulating valve including means in circuit between said torque convertor and said reservoir for regulating the quantity of fluid returning from said torque convertor to said reservoir in accordance with the pressure of said excess fluid, said quantity of fluid returning from said torque convertor increasing and decreasing in accordance with variations in said pressure of said excess fluid;



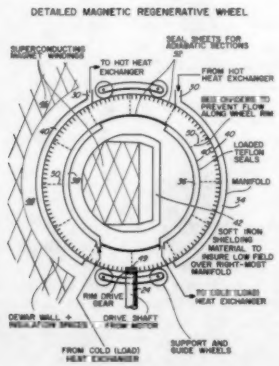
passage means for by-passing at least a portion of said fluid, returning from said torque convertor to said means for regulating quantity of fluid returning to said reservoir, from the regulating device and toward said reservoir, circulation to and from said reservoir of a minimum quantity of fluid for use in said torque convertor being maintained.

4,408,463

WHEEL-TYPE MAGNETIC REFRIGERATOR

John A. Barclay, Los Alamos, N. Mex., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 20, 1982, Ser. No. 340,904
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—3 **19 Claims**


DETAILED MAGNETIC REGENERATIVE WHEEL
SUPERCONDUCTING MAGNET WINDINGS
SEAL SHEETS FOR ADIABATIC SECTIONS
TO HOT HEAT EXCHANGER
FROM HOT HEAT EXCHANGER
SEE DIVIDERS TO PREVENT FLOW ALONG WHEEL Rim
LOADED TEFLON SEALS
MANIFOLD
SOFT IRON SHIELDING MATERIAL TO ENSURE LOW FIELD OVER RIGHT-MOST MANIFOLD
TO COLD (LOAD) HEAT EXCHANGER
RIM DRIVE GEAR
DEWAR WALL + INSULATION SPACES
DRIVE SHAFT FROM MOTOR
FROM COLD (LOAD) HEAT EXCHANGER
SUPPORT AND GUIDE WHEELS

1. A magnetic regenerative wheel refrigerator comprising:

a substantially circular wheel comprising an axis of rotation and concentric inner and outer rims;

ferromagnetic or paramagnetic porous material disposed within said wheel between said inner and outer rims, said material comprising at least one substance, said material having a Curie temperature near a cold temperature T_C near said inner rim and a Curie temperature near a hot temperature T_H near said outer rim;

an approximately solenoidal-shaped magnet disposed to produce a magnetic field essentially perpendicular to said axis of said wheel and parallel to its direction of rotation;

means for driving said wheel about its axis of rotation and through said magnetic field;

means for maintaining said wheel in proper orientation;

first and second inner fluid manifolds adjacent said inner rim of said wheel;

first and second outer fluid manifolds adjacent said outer rim of said wheel;

thermal load exchange means;

heat rejection exchange means; and

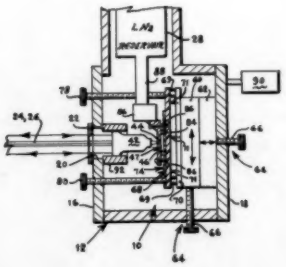
means for pumping and conducting a fluid from said heat rejection exchange means through said first outer manifold, through a first portion of said material in said wheel adjacent said first outer manifold, from outer rim to inner rim, into and through said first inner manifold to said thermal load exchange means, from there through said second inner manifold, through a second portion of said material in said wheel adjacent said second inner manifold into and through said second manifold and back to said heat rejection means.

4,408,464

DEWAR COOLING CHAMBER FOR SEMICONDUCTOR PLATELETS

Michael M. Salour, Cambridge, Mass., and Charles B. Roxlo, Fanwood, N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1982, Ser. No. 361,020
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **11 Claims**



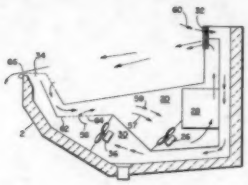
1. A Dewar cooling chamber comprising a housing, said housing forming a chamber therein; means located within said chamber for securely supporting an object and moving said object in three dimensions; and means operably connected to said object supporting and moving means for providing a cooling environment for said object, said cooling means being capable of moving in conjunction with said object in said three dimensions.

4,408,465

MULTIBAND REFRIGERATED DISPLAY CASE HAVING A TOP ACCESS OPENING

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,542
The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.
Int. Cl.³ F25D *21/12*
U.S. Cl. 62—82 21 Claims



18. A method of operating an open top refrigerated display case where the display case includes:

a cabinet having top, bottom and opposing side walls and an opening within the top wall for enabling access to products displayed within the display case; an inner air conduit passing around the side and bottom walls of the cabinet and having a first air outlet opening adjacent one end of the opening in the top wall of said cabinet and a first air inlet opening adjacent the other end of said opening in said top wall of the cabinet with the first air outlet and the first air inlet being aligned so that air leaving the first outlet is directed towards and received by the first air inlet; and, an outer air conduit passing along the bottom and side walls of the cabinet and being arranged adjacent to the inner air conduit but outwardly therefrom and having a second air outlet opening adjacent one end of the opening in the top wall of the cabinet and a second air inlet located adjacent the other end of the opening in the top wall of the cabinet with the second air outlet and the second air inlet being aligned so that air leaving said second air outlet is directed towards and received by the second air inlet; said method comprising the steps of:

circulating air through the inner air conduit so as to establish an inner air band and an inner air curtain across the opening in the top wall of the cabinet;

cooling air passing through the inner air conduit only during a refrigeration cycle of operation of the display case;

circulating air through the outer air conduit so as to establish an outer air band with an outer air curtain across the opening in the top wall of the cabinet;

causing ambient air to pass through the inner air conduit during a defrost cycle and ceasing the cooling of the air during such defrost cycle;

reversing the direction of air flow through the inner and outer air conduits during a defrost cycle of operation so that ambient air from outside of the display case is drawn into both conduits during a defrost cycle of operation.

4,408,466

ELECTRICAL CIRCUIT AND METHOD OF OPERATING SUCH

Thomas W. Brown, Sterling, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 16, 1982, Ser. No. 349,378
Int. Cl.³ F25B *27/00*
U.S. Cl. 62—208 19 Claims

1. An electrical circuit adapted for controlling the operation of a refrigerant compressor in an automotive type air conditioning system, the circuit comprising:

a battery;

a clutch device for coupling in driving relation with the compressor to effect the operation thereof in the system and including first coil means adapted for energization across said battery to effect the coupling of said clutch device in the driving relation thereof with the compressor;

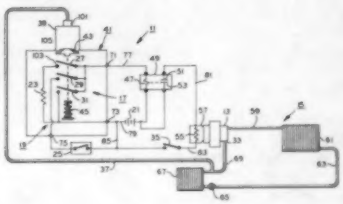
a relay device including at least a set of contact means operable generally between an open position and a closed position for controlling the energization of said first coil means across said battery, and second coil means adapted for energization in series with said battery to effect the operation of said at least contact means set;

temperature responsive means operable generally in the event of the occurrence of an atmospheric temperature less than a preselected value for switching from one of the conductivity modes of a pair thereof to the other of the conductivity modes into circuit relation with said battery;

resistor means for selective connection in circuit relation with said second coil means and said battery and having a preselected resistance value;

means operable from an open position to a closed position for switching said resistor means and said battery into series circuit relation with said second coil means when said temperature responsive means is in the one conductivity mode thereof and with the preselected resistance value being effective to obviate the energization of said second coil means in the circuit relation thereof with said battery;

means operable from an open position to a closed position generally sequentially subsequent to said first named switching means for switching said second coil means into circuit relation with said battery and said temperature



responsive means when in the other conductivity mode thereof to effect the energization of said second coil means and the operation in response thereto of said at least contact means set to the closed position thereof so as to energize said first coil means across said battery and effect the coupling of said clutch device in its driving relation with the compressor;

means operable from an open position to a closed position generally sequentially subsequent to the operation of said last named switching means for shunting said resistor means and said last named switching means in the series circuit relation thereof with said battery and for switching said second coil means directly into circuit relation with said battery when said temperature responsive means is in the one conductivity mode thereof to effect the energization of said second coil means and the operation in response thereto of said at least one contact means set to the closed position thereof so as to energize said first coil means across said battery and effect the coupling of said clutch device in its driving relation with the compressor;

diaphragm means subjected to a monitored fluid pressure in the system and movable in response to first, second and third increasing preselected values of the monitored fluid pressure for effecting the sequential operation of said first named switching means, said last named switching means, and said shunting and switching means, respectively; and

resilient means operable generally for opposing the movement of said diaphragm means and for effecting the sequential return from the closed position to the open posi-

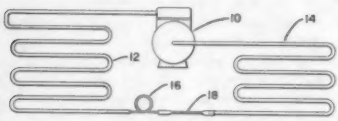
tion of said shunting and switching means, said last named switching means, and said first named switching means upon successive decreases in the monitored fluid pressure acting on said diaphragm means to values less than the third, second and first preselected values of the monitored fluid pressure, respectively.

4,408,467

NOISE SUPPRESSING FEEDER TUBE FOR A REFRIGERANT CIRCUIT

Raymond J. Murnane; Stephen C. Gomore, both of Minoa, and Myron Mathewson, Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,798
Int. Cl.³ F25D *19/00*
U.S. Cl. 62—296 **4 Claims**



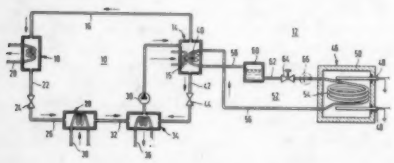
1. A vapor compression refrigerant circuit including a compressor, condenser, evaporator and expansion device all connected to form a refrigeration circuit which comprises a feeder tube joining the expansion device to the evaporator, said feeder tube having a first cylindrical end for joining to the expansion device, a flattened portion of reduced cross-sectional area and a discharge end cylindrical in configuration for joining to the evaporator, said flattened portion acting to suppress noise caused by the flow of refrigerant from the expansion device to the evaporator.

4,408,468

SYSTEM COMPRISING AT LEAST ONE ABSORPTION HEAT PUMP

Georg Alefeld, Josef-Raps-Strasse 3, Munich 40, and Peter Maier-Laxhuber, Munich, both of Fed. Rep. of Germany, assignors to Georg Alefeld, Munich, Fed. Rep. of Germany

Filed Sep. 17, 1980, Ser. No. 188,120
Claims priority, application European Pat. Off., May 16, 1980, 80 102725; Fed. Rep. of Germany, Sep. 17, 1979, 2939423
Int. Cl.³ F25B *15/00*
U.S. Cl. 82—476 **18 Claims**



1. A heat pump system including an absorption heat pump, comprising:

a generator-absorber for generating a vaporized working medium from an absorption material and subsequently re-absorbing the working medium in the absorption material;

heating means for heating the absorber-generator;

a condenser for condensing the generated working medium;

a storage vessel for storing the condensed working medium;

expansion means for decreasing pressure and fixing the flow rate of the condensed working medium; and

an evaporator for evaporation of the working medium, characterized in that:

(a) the generator-absorber includes a zeolite as absorption material;

(b) a heat output circuit is coupled to the generator-absorber for output, as useful heat, of the absorption heat given up on absorbing the working medium in the absorption material; and

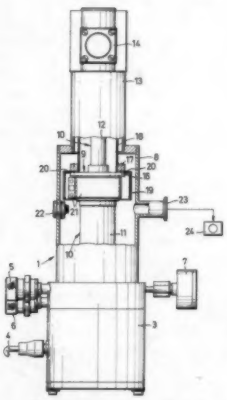
(c) the heating means in combination with the generator-absorber is so constructed that the condensation temperature in the condenser is of the order of 80° C. or higher.

4,408,469

REFRIGERATOR CRYOSTAT

Hans-Joachim Forth, Cologne, Fed. Rep. of Germany, assignor to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,152
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046458
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **6 Claims**



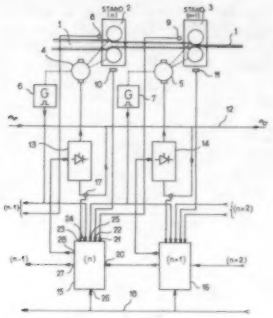
1. In a refrigerator cryostat system for providing high vacuums at controlled temperatures in a sample chamber thereof, the system comprising a cryostat having a casing, an opening into the casing only for preliminarily evacuating the casing, first and second refrigerator stages in the casing for producing progressively lower temperatures, a sample chamber in thermal communication with the second refrigerator stage and vacuum communication with the casing, and heating means independent of the second refrigerator stage for variably heating the sample chamber, whereby, between the second refrigerator stage and the heating means, the temperature of the sample chamber may be controlled in a range of, for example, from about 10° K. to about 350° K., the temperature of the first refrigerator stage being substantially constant and independent thereof, the improvement comprising:

a pumping surface **(19)** inside the casing and in thermal communication with the first refrigerator stage for cryogenically augmenting the preliminary evacuation of the casing during operation of the first refrigerator stage.

4,408,470
PROCEDURE AND DEVICE FOR ROLLING METALS WITHOUT STRESS

Jacques Fromont, Vanves, and Marcel Plancon, Le Chesnay, both of France, assignors to Jeumont-Schneider Corporation, Puteaux, France

Filed May 26, 1981, Ser. No. 266,916
Claims priority, application France, May 28, 1980, 80 11796
Int. Cl.³ B21B *37/00*
U.S. Cl. 72—8 **9 Claims**

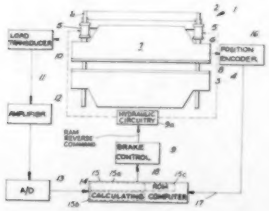


1. A method of rolling metal without stress in a continuous rolling mill that has a plurality of successive non-reversible stands, and has, for each stand, a torque regulator and a speed regulator, each acting upon a circuit that controls a drive motor for the stand, the method comprising determining and recording the value of the rolling torque of a preceding stand (n) just prior to the introduction of the metal into a succeeding stand (n+1); controlling the speed regulator of the preceding stand to hold the value of the rolling torque constant, said controlling beginning upon the introduction of metal into the succeeding stand and continuing up to an instant just prior to the introduction of the metal into a next succeeding stand (n+2) following said succeeding stand; and maintaining constant the voluminal flow of metal from each stand until rolling in the preceding stand is complete, said maintaining comprising controlling the speed regulator of the preceding stand.

4,408,471
PRESS BRAKE HAVING SPRING-BACK COMPENSATING ADAPTIVE CONTROL

David C. Gossard, Watertown, Mass.; John West, Washington, D.C.; Kim A. Stelson, Cambridge, Mass.; Blair Allison, Melrose, Mass.; R. Davis Webb, Jr., Marion, Mass., and David Hardt, Weston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 29, 1980, Ser. No. 201,999
Int. Cl.³ B21D *5/02*
U.S. Cl. 72—21 **16 Claims**

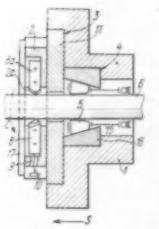


1. In a press brake for bending metal sheet and the like of the type having a frame supporting a bed, a die member mounted on the bed, a ram displaceable with respect to said bed, a punch member mounted on the ram and configured to engage the die member, means for moving said ram toward said bed and reversing means for moving said ram away from said bed, the improvement in combination therewith comprising adaptive control means for compensating for material springback to accurately produce a desired bend angle in the sheet with a single ram stroke, said control means comprising means for sensing the position of the ram to produce a ram position signal, means for sensing the force supplied to the ram to produce a load signal, and digital data processing means responsive to said position and load signals for determining the precise point of punch penetration at which to activate said reversing means to cause ram reversal to produce the desired bend angle.

4,408,472
APPARATUS FOR THE MACHINING ON CYLINDRICAL SURFACES ON METAL-CUTTING LATHES

Gennady M. Azarevich, ulitsa akademika Yangelya, 14, korpus 2, kv. 257; Jury V. Maximov, ulitsa Lesteva 18, kv. 36; Boris I. Akimov, Simonovsky val, 7, korpus 1, kv. 249, and Iosif A. Gusyatsky, ulitsa Malaya Bronnaya, 10, kv. 35, all of Moscow, U.S.S.R.

Filed Mar. 9, 1981, Ser. No. 242,113
Int. Cl.³ B23B *11/00*
U.S. Cl. 72—71 **8 Claims**



1. An apparatus for the machining of cylindrical surfaces on metal-cutting lathes, comprising: a housing, a toolholder having an opening passing therethrough for passage of work being mechined, two tools clamped in said toolholder so that points of the tools are arranged opposite each other, guides located in a plane at right angles to the axis of the work being machined and attached to said housing with provision for rotation during setting-up, said toolholder with said tools being fitted to said guides with provision for floating at right angles to the axis of the work in the course of machining, and a head with deforming rollers contained in said housing.

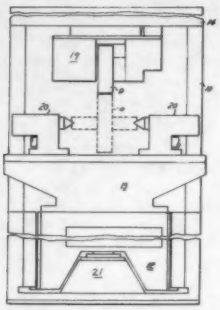
4,408,473
GEAR-ROLLER

Arthur B. Bassoff, Oak Park, Mich., assignor to Lear Siegler, Inc., Mt. Clemens, Mich.

Filed Nov. 9, 1981, Ser. No. 319,684
Int. Cl.³ B21D *53/28*; B21H *5/00*; B21K *1/30*; B23P *15/00*
U.S. Cl. 72—108 **17 Claims**

1. A gear rolling machine for finish rolling gears comprising a rigid frame, a rotary work support on said frame for supporting a work gear thereon, a rotary tool support on said frame for supporting a gear-like die thereon in position to mesh with a work gear on said work support, means for driving one of said rotary supports in rotation, and feed means for mounting one of said supports on said frame for movement in a direction such that a work gear and a gear-like die in mesh with each other develop pressure of metal deforming intensity between the teeth thereof, said feed means comprising feed screw and nut members connected between the movable support and said

frame, and means for effecting relative rotation between the feed screw and nut members comprising a worm gear fixed to one of said members, a worm in meshed engagement with said worm gear, means mounting said worm for rotation and for limited axial displacement, drive means connected to said worm for rotating said worm, blocking means to terminate rotation of said worm and to maintain said worm positively



against further rotation, and pressure relaxing means to displace said worm axially without rotation thereof to effect predetermined rotation of said worm gear to in turn effect a relative rotation between said nut and screw members and controlled separation between said work gear and die to substantially reduce the pressure between the meshed teeth thereof.

4,408,474

METAL STRIP STRETCHING MILL

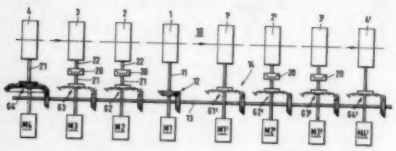
Armin S. P. Hutzenlaub, Wiehl, and Willi Schmidt, Nümbrecht-Elsenroth, both of Fed. Rep. of Germany, assignors to Fa. Erwin Kampf GmbH & Co., Wiehl, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,275

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026129

Int. Cl.³ B21B *39/08, 35/14*

U.S. Cl. 72—205 **5 Claims**



1. A metal strip stretching mill comprising in combination:

a central stretching station;

a group of at least two pulling rolls adjoining the stretching station on one side, including a proximate pulling roll which is located in the immediate vicinity of the stretching station;

a similar group of at least two braking rolls adjoining the stretching station on the opposite side and including a proximate braking roll which is located in the immediate vicinity of the stretching station;

drive shafts connecting said two proximate rolls to a speed-adjustable drive means imparting to said proximate rolls an adjustable circumferential speed;

drive shafts connecting the non-proximate rolls of both groups of rolls to torque-adjustable drive means imparting to each of said non-proximate rolls an ajustable drive torque, or braking torque, respectively, the power input to the non-proximate rolls in each group being stepped down as a function of the distance of the particular roll from the stretching station; and

a disconnectable clutch on the drive shafts of at least one non-proximate pulling roll and at least one non-proximate braking roll, said clutches being operable to switch said pulling and braking rolls to an idling mode, for a downward expansion of the effective power range of the metal strip stretching mill, through the selective idling of non-proximate rolls in both groups of rolls.

4,408,475

ROLLING MILL ROLLS

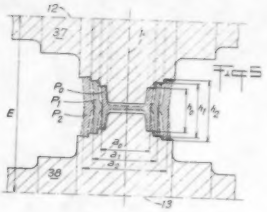
Gabriel B. Mennel, Nilvange, France, assignor to Sacilor Aciéries et Laminoirs de Lorraine, Hayange, France

Filed Feb. 2, 1981, Ser. No. 230,335

Claims priority, application France, Feb. 4, 1980, 80 02383

Int. Cl.³ B21B *1/08*

U.S. Cl. 72—221 **3 Claims**



1. A rolling mill stand serving particularly for the edging of shapes such as rails, beams, channels, squares, diamonds, rounds, tie plates, joint bars or other similar shapes, characterized in that it comprises a set of rolls having a plurality of grooves for shapes with different web heights, nested in such a way that the whole of the part of a groove serving as a surround to the shortest web is common to all the nested grooves in such a way that the vertical plane of symmetry of at least one nested groove is merged with the transversal median plane of the rolls.

4,408,476

ROLLING LINES

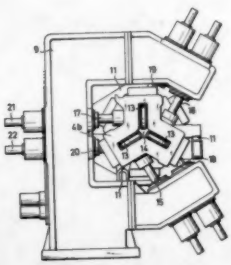
Hans Brauer, Leichlingen, and Werner Demny, Düsseldorf, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Continuation of Ser. No. 18,897, Mar. 9, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 285,342

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811931; Dec. 23, 1978, 2855892

Int. Cl.³ B21B *13/00*

U.S. Cl. 72—229 **42 Claims**



1. A rolling line for the rolling of billets, bars or wire to provide a substantial reduction in cross section by repeated incremental reductions, comprising at least one rolling stand whose rolling direction is reversible and which has only one

sizing pass formed by at least three rolls which are arranged in a star-like manner around the central longitudinal axis of a pass line for work material to be rolled through which said billets, bars and wires are repeatedly passed back and forth for reduction in cross section, said rolls having a substantially larger diameter than axial width and a substantially cylindrical working surface and being adjustable radially of the roll axis a distance at least equal to the total radial reduction in cross section of said billets, bars or wire, means for simultaneously adjusting said rolls radially uniformly before each successive pass of the work material while maintaining the central longitudinal axis of the sizing pass and of the work material fixed.

4,408,477

ADJUSTABLE PRESS TOOL

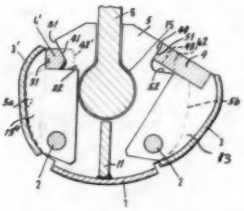
Rolf Kümmerling, Essen; Robert Poos, Grevenbroich; Thomas Pentzien, Duisburg, and Karl-Heinz Papierok, Essen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,529

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3133178

Int. Cl.³ B21D *37/02*

U.S. Cl. 72—478 **3 Claims**



1. A press-working tool with a generally U-shaped contour for making tubes or pipes of a relatively large diameter, such as 600 millimeters and larger, at a diameter-to-wall-thickness ratio of approximately 13 and larger, comprising:

an arcuate centerpiece having an outwardly oriented convex working surface and a radially inwardly arranged mounting structures;

a pair of symmetrically contoured side pieces with generally convex working surfaces, being hinged to the mounting structure; and

a pair of spacer bars having different cam positions and being interposed between the side pieces and the mounting structure to establish a particular angular position for the side pieces.

4,408,478

HEATABLE CELL FOR PHOTOACOUSTIC TESTS

Paul Bechthold, Pulheim-Dansweiler; Franz Joswig, Jülich, and Josef Lingenbach, Düren, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,034

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 8008158[U]

Int. Cl.³ G01N *21/00*

U.S. Cl. 73—24 **9 Claims**

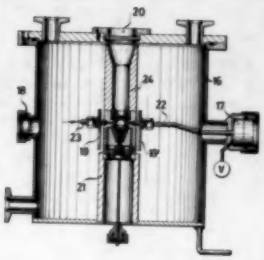
1. A heatable cell arrangement for photoacoustic tests comprising:

a sample holding chamber including:

a chamber body forming the side wall of said chamber and having at one end a sealing surface and at its opposite end a light admission window which closes said chamber body;

a chamber closure having a sealing surface engaging said sealing surface of said chamber body, said chamber closure delimiting that side of said chamber opposite said light admission window, and being provided with a recess for receiving test samples; and

at least one heating winding provided on at least one of said chamber closure and said chamber body; and



a detector microphone having a microphone chamber which is arranged lower than said sample holding chamber to preclude convection and which is connected to said sample holding chamber by a thin-walled connecting tube having poor heat-conducting properties.

4,408,479

KNOCKING DETECTING DEVICE FOR INTERNAL COMBUSTION ENGINES

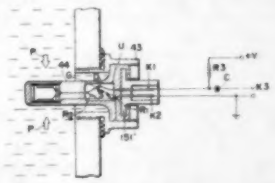
Kiyokazu Asai; Yujiro Oshima; Akihiro Takeuchi, all of Nagoya, and Hiroharu Tokoro, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Feb. 3, 1982, Ser. No. 345,537

Claims priority, application Japan, Feb. 9, 1981, 56-17880

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **11 Claims**



1. A knocking detecting device for an internal combustion engine including an engine block having combustion and water chambers defined by a partition and a coolant water passage connected to the water chamber, said knocking detecting device comprising:

a casing in the form of an annular member fastened substantially perpendicularly to an outer sidewall of said engine block;

a support member made of a vibration-isolating material of any one of rubber and synthetic resin, and having one end fastened in a liquidtight manner to said casing and the other end projecting a predetermined distance from the outer sidewall of said engine block to a position within said water chamber;

a pressure-sensitive member including pressure-sensitive surfaces mounted on the projecting end of said support member and facing away from each other, said pressure-sensitive surfaces extending perpendicularly to the outer sidewall of said engine block, for detecting, as a change in an electrical signal, pressure vibrations transmitted as a knocking sound to said pressure-sensitive surfaces through coolant water from said partition when knocking is produced in said combustion chamber; and

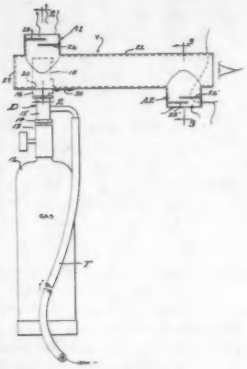
lead wires extending through said support member and connected to said pressure-sensitive member for delivering the electrical signal change responsive to the knocking as detected by said pressure-sensitive member exteriorly of the engine block, whereby only the knocking produced in the combustion chamber can effectively be detected as the pressure vibrations in the coolant water.

4,408,480

GAS LEAK DETECTOR VIEWER

Eugene J. Christie, P.O. Box 5372, Mission Hills, Calif. 91345

Filed Sep. 25, 1981, Ser. No. 305,485
Int. Cl.³ G01M *3/04;* G01N *31/12*
U.S. Cl. 73—40.7 **3 Claims**



1. A viewer for enabling flame visability of Halide gas leak detector in the presence of sunlight, and including; an elongated tubular body closed at one end and open at the other end for closure by means of close proximity to the face of the person aligning an eye for observation through said tubular body toward said one closed end thereof, a receiver opening at a lower side of the tubular body at said one closed end thereof, the Halide gas leak detector having a shield holder for a burner body producing the said flame and inserted through the receiver opening and held positioned within said one closed end of the tubular body, a light restricting exhaust ventilator at the upper side of the tubular body and venting the flame of the gas leak detector positioned within the tubular body through said receiver opening, and a light restricting induction ventilator at the lower side of the tubular body at said open end thereof for convection inlet flow of air and thermal protection of the person's face and eye, whereby outside sunlight is obscurbed from the interior of the tubular body and the flame is discriminately viewed in darkness.

4,408,481

PORE PRESSURE PROBE ASSEMBLY AND TWO-STAGE EMPLACEMENT THEREOF

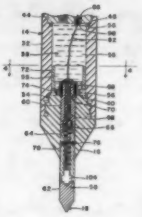
Roger Sidey, Richmond, England, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 12, 1982, Ser. No. 357,444
Int. Cl.³ G01L *11/00;* G01N *33/24*
U.S. Cl. 73—73 **9 Claims**

6. In a system for measuring transient pore water pressure in the ground, a two-stage method for emplacement of a probe assembly at a desired location in the ground, said emplacement method comprising the steps of:

(a) in an initial stage, emplacing into the ground to a desired location therein a primary probe member of said probe assembly in said measuring system; and

(b) in a final stage, ejecting into the ground at the desired location a secondary probe member of said probe assembly which is contained within said primary probe member



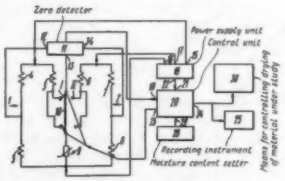
and, in turn, contains a pressure sensor capable of responsive coupling with pore water pressure at the desired location.

4,408,482

METHOD AND APPARATUS FOR THE DETERMINATION OF MOISTURE CONTENT OF FIBROUS AND GRANULAR MATERIALS

Vadim F. Zhuravlev, Moscow, and Alexei G. Belov, Pushkino, both of U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Institut Kozhevenno-Obuvnoi Promyshl.-nosti, Moscow, U.S.S.R.

Filed Dec. 18, 1981, Ser. No. 332,150
Int. Cl.³ G01N *5/00, 25/56;* H05B *1/02*
U.S. Cl. 73—75 **4 Claims**



1. A method for the determination of moisture content of fibrous and granular materials, comprising the following steps:

bringing a sensitive element in contact with a fibrous or granular material under study;

preliminarily applying a pulse heating to said sensitive element at the moment when it is brought in contact with said studied material, to between 40° and 90° C.;

obtaining information from said sensitive element on said preliminary pulse heating;

applying a main pulse heating to said sensitive element, to between 90° and 140° C.;

obtaining an information from said sensitive element on said main pulse heating from said sensitive element; and

evaluating the moisture content of the studied material upon receiving said information, namely based on the time for the main heating of said sensitive element.

4,408,483

ENGINE MONITORING SYSTEM

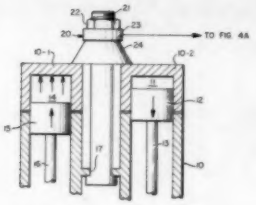
John G. Bollinger, Madison, Wis.; Richard E. Nichols, and Dale H. Delaruelle, both of Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 21, 1981, Ser. No. 294,990
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—115 **47 Claims**

1. For use with an internal combustion engine, an arrangement for analyzing the operation of said engine comprising:

first means, adapted to be coupled to said engine, for produc-

ing an output signal representative of at least one prescribed characteristic of a plurality of cylinders of said engine; and



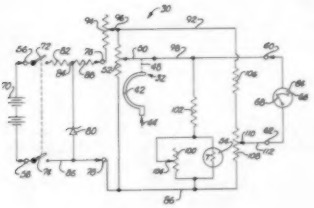
second means, coupled to said first means, for selectively analyzing said output signal and producing therefrom an output representative of the operation of a selected one of said plurality of cylinders.

4,408,484

TEMPERATURE COMPENSATED GAUGE FOR PRESSURIZED GAS SUCH AS NATURAL GAS FUEL FOR VEHICLES

Roman R. Erickson, Kansas City, Kans., assignor to Gas Service Energy Corporation, Kansas City, Mo.

Filed Jun. 4, 1981, Ser. No. 270,628
Int. Cl.³ G01F *17/00*
U.S. Cl. 73—149 **18 Claims**



1. In apparatus for gauging the quantity of a gas within a system presenting a predetermined volume in which said gas is confined under pressure;

electrically responsive means having a pair of input terminals for measuring the magnitude of an electrical input applied to said input terminals and providing an indication corresponding thereto;

first electrical circuit means adapted for coupling with a source of electrical power and having a branch coupled with one of said input terminals, for applying to said one input terminal a first electrical potential of a preselected reference level;

pressure responsive, variable, electrical impedance presenting means operably associated with said system for presenting a first electrical impedance of variable magnitude influenced by and correlated with the pressure of said gas within said system;

temperature responsive, variable, electrical impedance presenting means operably associated with said system for presenting a second electrical impedance of variable magnitude influenced by and correlated with the temperature of said gas within said system; and

second electrical circuit means adapted for coupling with a source of electrical power, having said first and second impedances coupled in series therewith, and having a branch electrically coupling the other of said input terminals with a point of said second circuit means electrically intermediate said first and second impedances for applying to said other input terminal a second electrical potential of variable level influenced by and correlated with combined effects of the respective magnitudes of said first and second impedances.

4,408,485

ROTARY STRADDLE TESTER APPARATUS WITH SAFETY JOINT BACK-OFF CLUTCH

Howard L. McGill, Lufkin, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,042
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—155 **8 Claims**

1. Apparatus adapted for use in drill stem testing a well interval that is isolated by inflatable packer means, comprising: relatively rotatable mandrel and housing assemblies, one of said assemblies being connected to said packer means and the other of said assemblies being connected to a pipe string extending upwardly to the surface; pump means responsive to rotation of said other assembly relative to said one assembly in the right-hand direction for supplying fluid under pressure to said packer means to inflate the same; a safety joint located in said apparatus between said one assembly and said packer means; and prevention means for enabling only right-hand rotation of said other assembly relative to said one assembly so that left-hand rotation of the pipe string can be employed to release said safety joint.

4,408,486

BELL NIPPLE DENSITOMETER METHOD AND APPARATUS

Robert W. Rochon, and Joe W. Sneed, Jr., both of San Antonio, Tex., assignors to Monarch Logging Company, Inc., San Antonio, Tex.

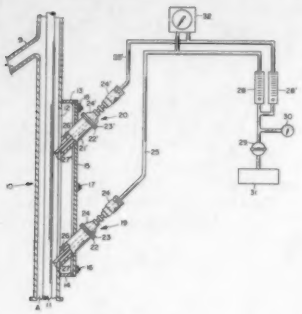
Continuation of Ser. No. 186,496, Sep. 12, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 431,718
Int. Cl.³ E21B *47/06*
U.S. Cl. 73—155 **5 Claims**

1. A method for continuously determining the amount of entrained gas in drilling fluid before the entrained gas is released to the atmosphere comprising the steps of:

flowing drilling fluid through the borehole;

continuously monitoring changes in the pressure of the drilling fluid at vertically spaced locations in a bell nipple

connected with the borehole before any entrained gases are released to the atmosphere; and



displaying changes in the differential pressures at the vertically spaced locations to determine changes in the weight of the drilling fluid due to entrained gases.

4,408,487

CARTON'S DEPRESSED LINE HEIGHT MEASURING DEVICE

Mikio Tano, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

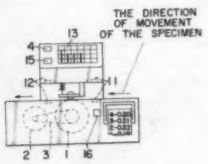
PCT No. PCT/JP80/00283, § 371 Date Jul. 21, 1981, § 102(e) Date May 29, 1981, PCT Pub. No. WO81/01460, PCT Pub. Date May 28, 1981

PCT Filed Nov. 19, 1980, Ser. No. 270,514

Claims priority, application Japan, Nov. 21, 1979, 54-160399

Int. Cl.³ G01B *7/34, 11/30*

U.S. Cl. 13—159 **15 Claims**



1. A carton's depressed line height measuring device comprising:

means for conveying in one direction a specimen which is formed into a carton by being folded and bonded together at predetermined ends;

means provided in said conveying means, for contacting the surface of said specimen to provide action according to the unevenness of said surface;

a means for forming an electrical signal according to the action of said action providing means;

zero setting means for detecting the rise of a signal from said signal forming means, which is caused according to the thickness of said specimen, to form a zero reference signal;

peak holding means for detecting and holding the peak value of said signal from said signal forming means; and

outputting means for substracting an output of said zero setting means from an output of said peak holding means and outputting the result of substraction.

4,408,488

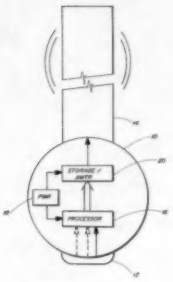
GENERALIZED DRIFTING OCEANOGRAPHIC SENSOR

Samuel W. Marshall, Box 526M, Torregano Rd., Slidell, La. 70458

Filed Apr. 5, 1982, Ser. No. 365,845

Int. Cl.³ G01D *11/24*

U.S. Cl. 73—170 A **2 Claims**



1. A drifting oceanographic sensor system comprising:

a variable buoyancy housing;

an oceanographic sensor connected externally to said housing;

means contained internal to said housing for processing and multiplexing the electrical signal from said sensor;

means for acoustically transmitting the data output from said processing and multiplexing means; and

means for adjusting the buoyancy of said housing such that said sensor system drifts along a pre-programmed depth schedule.

4,408,489

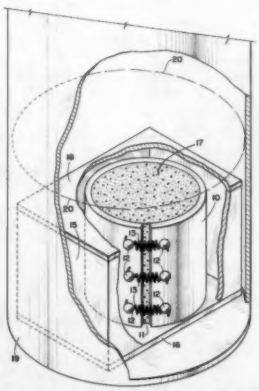
APPARATUS AND METHOD FOR MEASURING THE EXPANSION PROPERTIES OF A CEMENT COMPOSITION

Lloyd B. Spangle, Claremore, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 134,716, Mar. 27, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,779

Int. Cl.³ G01N *33/38, 33/44*

U.S. Cl. 73—432 R **10 Claims**



1. An apparatus for measuring the expansion properties of a cement slurry composition, which sets up to form a solid

phase, and which is expandable during the setting-up period, the apparatus comprising:

a sleeve having at least one vertical slit therein;

the sleeve includes at least one set of pins, consisting of two pins, the pins are mounted in horizontal alignment on the sleeve, and the pins are located on opposite sides of the verical slit;

at least one spring member, the spring member connects the two pins together;

the sleeve has a closed position, in which it can receive and contain the cement slurry composition, and the sleeve has an open position, in which it expands outwardly, such that it can contain the cement composition as it expands during the setting-up period;

a retainer vessel in which the sleeve is placed during the setting-up period of the cement slurry composition, and the retainer vessel completely encloses the sleeve and cement slurry composition during said setting-up period; and

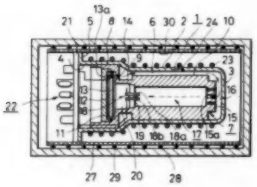
a pressure vessel which contains a liquid medium, and the retainer vessel, sleeve and cement slurry composition are placed in the pressure vessel, such that they are submerged in said liquid medium during the setting-up period of the cement slurry composition.

4,408,490

ANGULAR VELOCITY SENSOR

Fumitaka Takahashi, Houya, and Hiroshi Gotoh, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 230,039
Claims priority, application Japan, Mar. 27, 1980, 55-39492
Int. Cl.³ G01P *15/08*
U.S. Cl. 73—497 **4 Claims**



1. An angular velocity sensor comprising: a casing, a sensor body placed within said casing, said sensor body having at least part of an outer peripheral surface thereof disposed in direct contact with said casing, said sensor body being formed with a nozzle hole, a gas flow sensor mounted within said sensor body and disposed to detect the temperature of a gas flow delivered thereto through said nozzle hole, said gas flow sensor being disposed to produce an output varying with deflection of said gas flow which is caused by angular velocity applied to said angular velocity sensor, a heating wire helically wound around said casing along substantially the whole length thereof and disposed in direct contact with said casing, thermo-sensitive switch means connected to said heating wire and arranged to detect the temperature within said casing and control the supply of electric current to said heating wire, said thermo-sensitive switch means being operable to control the rate at which electric current is supplied to said heating wire in response to the temperature within said casing so as to keep said temperature at a constant value, an airtight housing formed of an insulating material, said casing positioned within said housing, a second heating wire helically wound on an inner wall of said housing, a second thermo-sensitive switch means arranged to detect the temperature within said housing and control the supply of electric current to said second heating wire, said second thermo-sensitive switch means being operable to control the rate of electric current being supplied to said second heating wire in response to the temperature within said housing so as to keep said temperature at a constant value, and said two thermo-sensitive switch means being operable to control the respective temperatures within said casing and said housing so that the temperature within said casing is higher than the temperature with said housing.

4,408,491

Patent Not Issued For This Number

4,408,492

SIGNAL PROCESSING EQUIPMENT FOR ULTRASONIC VISUALIZATION

George Kossoff, Northbridge, and David E. Robinson, Bilgola Plateau, both of Australia, assignors to The Commonwealth of Australia, Phillip, Australia

PCT No. PCT/AU80/00070, § 371 Date May 13, 1981, § 102(e) Date May 13, 1981, PCT Pub. No. WO81/00807, PCT Pub. Date Apr. 2, 1981
PCT Filed Sep. 19, 1980, Ser. No. 269,057
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—631 **9 Claims**

3. A method of ultrasonic examination of an object comprising subjecting the object to ultrasonic examination by an echoscpe having a time gain compensation facility, characterized by the steps of:

(a) directing a first pulse of ultrasonic energy into the object;

(b) monitoring the intensity of a first reflected ultrasonic signal from a first predetermined contour within the object, and the intensity of a second reflected ultrasonic signal from a second predetermined contour within the object;

(c) determining the sensitivity of the time gain compensation value that is necessary to ensure that the first reflected signal has a predetermined intensity;

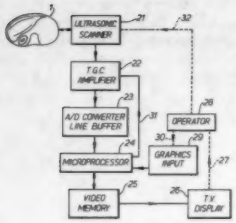
(d) determining the attenuation exhibited between the first and second contours;

(e) storing the determined value of the attenuation of step (d) in a memory;

(f) repeating steps (a) to (e) for each pulse of the sequence of ultrasonic energy pulses required to effect a complete echogram of the object;

(g) deriving, from the entire stored values of atenuation in said memory, an average value of attenuation between the first and second contours and an average value of the slope of the time gain compensation required to compensate therefor; and

(h) directing a second sequence of pulses to effect a complete echogram into the object, and using the determined time



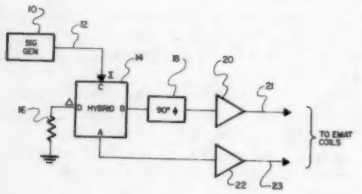
gain compensation for each pulse of step (c) and the average slope of the time gain compensation, obtaining a complete echogram of the object.

4,408,493

DIRECTIONAL ULTRASONIC TRANSDUCERS

William E. Peterson, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 24, 1982, Ser. No. 361,319
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—643 **16 Claims**



1. An apparatus for interacting with acoustic wave energy of wavelength λ in an electrically conductive object, comprising:

an electromagnetic acoustic transducer, including a source of magnetic flux for producing a magnetic field extending into the object, a first periodic coil within said field, and a second periodic coil offset from said first coil within said field;

a four port hybrid, with a first port connected to said first coil and a second port connected to said second coil; and

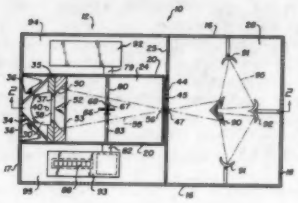
a phase delay element interposed between said first port and said first coil.

4,408,494

ULTRASOUND MEASURING INSTRUMENT

John N. Koblanski, Burnaby, Canada, assignor to Ocean Ecology Ltd., Canada

Filed Jul. 30, 1981, Ser. No. 288,435
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—646 **15 Claims**



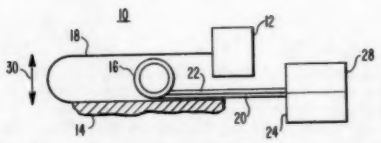
1. An ultrasonic measuring instrument comprising a chamber, mounting means for supporting a sound generator at one end of the chamber, focusing means near said one end of the chamber for concentrating sound waves emanating from sound generator at a focal point near an opposite end of the chamber, and measuring means for determining the intensity of the sound waves including a movable member supported within the chamber to project into the energy beam, said movable member being moved by the sound waves to an extent related to the intensity of said waves, and an indicating system actuated by movement of the movable member to provide an indication of the intensity of the sound waves, said indicating system comprising a spindle rotatably supporting the movable member within the chamber, a pointer carried by the spindle, and a scale on the housing adapted to be swept by the pointer.

4,408,495

FIBER OPTIC SYSTEM FOR MEASURING MECHANICAL MOTION OR VIBRATION OF A BODY

Robert D. Couch, New Freedom, Pa., and Bruce N. Lenderking, Glen Burnie, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1981, Ser. No. 308,317
Int. Cl.³ G01H *9/00*; G02B *5/14*
U.S. Cl. 73—655 **4 Claims**



3. A method of measuring mechanical motion or vibration of a body relative to a fixed mechanical reference point, with an elongated fiber optic waveguide mechanically coupled to the body and the fixed mechanical reference point, which fiber optic waveguide is bent beyond the critical angle at which light directed through the waveguide is substantially totally internally reflected along the waveguide, which method comprises;

amplifying the force acting on the body,

directing light through the bent waveguide,

detecting the reduction in light intensity transmitted through the bent waveguide as the waveguide bend radius changes due to the mechanical force imparted to the waveguide by the mechanical motion of the body, and generating an electrical signal which is a function of this reduced light intensity and of the mechanical motion or vibration of the body.

4,408,496

PRESSURE-SENSING TRANSDUCER

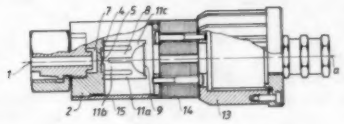
Orvar Dahle, Västeras; Bertil Hoffman, Kolbäck; Jan Nordvall, Västeras; Sture Siby, Västeras, and Ake Widehn, Västeras, all of Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Mar. 13, 1981, Ser. No. 243,450

Claims priority, application Sweden, Mar. 19, 1980, 8002137

Int. Cl.³ G01L *9/10*

U.S. Cl. 73—728 **7 Claims**



1. A pressure-sensing transducer which can be used to continuously measure the cylinder pressure in an internal combustion engine, said pressure-sensing transducer comprising

a pressure-transmitting element which includes a generally tubular seat having a bottom end and a top end and defining a longitudinal axis therethrough, and a metallic plate which closes off the top end of said seat so as to form a cavity within said seat into which hot gases from an internal combustion engine can flow, said metallic plate including a centrally located projection portion extending away from its side opposite the cavity in said seat,

a generally M-shaped force transmitting member having two outer legs and two inner legs, the bottom ends of the two inner legs being connected together and the top ends of the two inner legs being respectively connected to the top ends of the two outer legs, the bottom ends of the two outer legs being connected to opposite portions of the top end of said seat and the bottom ends of the two inner legs being connected to the projection portion of said metallic plate, and

a force-sensing member connected between the top ends of the two outer legs of said generally M-shaped force-transmitting member so as to be oriented generally perpendicularly with respect to said longitudinal axis, said force-sensing member comprising a plate having four apertures therein, two of the apertures supporting an excitation winding and two of the apertures supporting a measuring winding, such that pressure forces acting along said longitudinal axis on said metallic plate from within said cavity will be transmitted by said force-transmitting member so as to create tensile forces in said force-sensing member measurable by said measuring winding.

4,408,497

ELECTROMAGNETIC FLOWMETER FOR MEASURING FERROMAGNETIC SLURRIES

Kazuie Suzuki, Tokyo, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,327

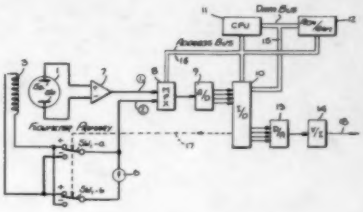
Int. Cl.³ G01F *1/60*

U.S. Cl. 73—861.17 **5 Claims**

1. An electromagnetic flowmeter for measuring the flow rate of a slurry containing ferromagnetic particles or a like magnetic substance which raises the specific permeability of the slurry above unity, said flowmeter comprising:

A. a flow tube through which the slurry is conducted, said tube having a pair of diametrically-opposed electrodes mounted thereon;

B. means to establish an electromagnetic field in the flow tube which is intercepted by the slurry to induce a signal in the electrodes which depends on flow rate, said means including an electromagnetic circuit whose core is provided with a gap defined by said tube and whose excitation coil is wound about the core, the magnetic resistance of the circuit changing as a function of the ferromagnetic



concentration of the slurry, this change affecting the inductance value of the coil;

C. means to measure the changing value of said inductance;

D. means coupled to said electrodes to provide an output signal; and

E. correction means responsive to said changing inductance value to modify said output signal as a function of said value to produce a corrected output signal which accurately reflects flow rate regardless of changes in ferromagnetic concentration.

4,408,498

TURBINE FLOW METERS

James H. Heath, Wareham, England, assignor to United Kingdom Atomic Energy Authority, London, England

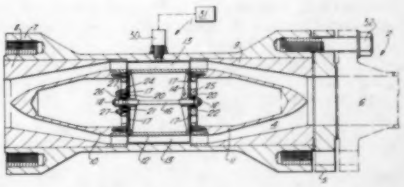
PCT No. PCT/GB80/00123, § 371 Date Mar. 25, 1981, § 102(e) Date Mar. 25, 1981, PCT Pub. No. WO81/00453, PCT Pub. Date Feb. 19, 1981

PCT Filed Aug. 1, 1980, Ser. No. 247,400

Claims priority, application United Kingdom, Aug. 6, 1979, 7927310; Dec. 13, 1979, 7943051

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.79 **10 Claims**



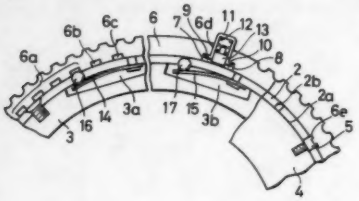
1. A turbine flowmeter for two-phase fluid flow, comprising a rotatably-mounted multi-bladed single rotor insertable in a flow conduit, the rotor being mounted in a housing and comprising a boss and a number of blades attached to the boss, the ratio of boss diameter to blade outside diameter being not less than seven to ten, the rotor blades being disposed in respect of the rotational axis at an angle proportional to blade radius and not greater than 15° at the tip.

4,408,499

CLICK STOP DEVICE

Yasuyuki Hanetshi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,099
Claims priority, application Japan, Jun. 5, 1980, 55/78502
Int. Cl.³ G05G 5/06
U.S. Cl. 74—527 **4 Claims**



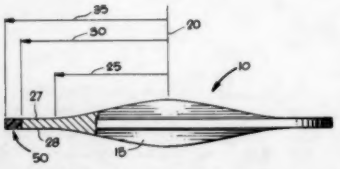
1. A click stop device for an interchangeable lens comprising: an aperture preset ring, a stationary ring and a mount ring, said preset ring being rotatably provided on an outer wall of said stationary ring and said stationary ring being integral with said mount ring, click grooves being formed in an inner wall of said aperture preset ring, said click grooves corresponding to manual aperture preset marks and an automatic aperture preset mark provided on an outer wall of said aperture prest ring; a first click spring and a first click ball biased by said first click spring toward said outer wall of said stationary ring, said first click ball engaging with an one of said click grooves to click stop said aperture preset ring; a hollow switch button provided for said aperture preset ring, a head of said switch button protruding outwardly from said aperture preset ring through a hole in said aperture preset ring, a switch pin slidably disposed in said hollow switch button; a coil spring interposed between said switch pin and said switch button in such a manner that elastic force of said spring depresses said switch button against an inner surface of said aperture preset ring and said switch pin against an outer surface of said stationary ring, two click grooves corresponding to a minimum manual aperture preset mark and said automatic aperture preset mark being formed between side walls of cuts formed on opposite sides of a base portion of said switch button and side walls of said switch pin; and a second click spring and a second click ball, said second click ball being biased by said second click spring through a hole in said stationary ring at a position so as to engage with either of said two click grooves formed on opposite sides of base portion of said switch button.

4,408,500

RIMMED AND EDGE THICKENED STODOLA SHAPED FLYWHEEL

Satish V. Kulkarni, San Ramon, and Richard G. Stone, Oakland, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 24, 1980, Ser. No. 190,306
Int. Cl.³ F16C 15/00
U.S. Cl. 74—572 **4 Claims**



1. A flywheel, which comprises:

(a) a body shaped symmetrically about both an axis of rotation and a midplane perpendicular to the axis of rotation; and

(b) said body having a thickness defined by the formula:

$$t = t_o \exp - Cr^2 \text{ where } 0 \leqq r \leqq \left[\frac{1}{C}\ln(t_o/T)\right]^{\frac{1}{2}}$$

$$t = T \qquad \text{where } \left[\frac{1}{C}\ln(t_o/T)\right]^{\frac{1}{2}} < r \leqq R$$

$$t = 0 \qquad \text{where } r > R$$

wherein:

r=the perpendicular distance from the axis of rotation,

t=the thickness of said body at a distance r from, and measured parallel to, the axis of rotation,

t_o=the thickness of said body at and along the axis of rotation,

T=the thickness of said body where said body is edge thickened,

R=the maximum radial dimension of said body, and

C=an arbitrary positive constant of dimensionality reciprocal length squared which relates to an infinite Stodola flywheel corresponding to said flywheel by equaling the expression $\rho\omega^2/2s_o$, wherein:

ρ=the material density of said flywheel and said corresponding infinite Stodola flywheel,

s_o=the material rupture stress of said flywheel and said corresponding infinite Stodola flywheel, and

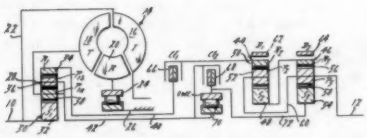
ω=the angular speed at rupture of said corresponding infinite Stodola flywheel.

4,408,501

MULTIPLE RATIO TORQUE CONVERTER TRANSMISSION WITH MAIN TRANSMISSION PLANETARY GEARING AND A COMPOUND TORQUE SPLITTER PLANETARY GEAR UNIT BETWEEN THE CONVERTER AND THE MULTIPLE RATIO GEARING

Po-lung Liang, Livonia, and Alan R. Fisher, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1981, Ser. No. 265,746
Int. Cl.³ F16H 47/08
U.S. Cl. 74—688 **6 Claims**



1. A hydrokinetic split torque transmission mechanism comprising a torque converter and a split torque gear unit;

said converter comprising an impeller, a turbine and a reactor situated in a torus circuit, said impeller having an impeller shell enclosing said turbine and said reactor, a torque input shaft connected to said impeller shell;

a split torque gear unit in said impeller shell comprising a ring gear, a sun gear and two planet gear sets, the planet gears of one set meshing with said ring gear and the planet gears of the other set meshing with said sun gear, said planet gears being journalled rotatably in engagement with each other on a common carrier;

a driving connection between said turbine and said common carrier, a first torque delivery shaft centrally located in said converter connected directly to said common carrier, a torque delivery sleeve shaft surrounding said first shaft connected directly to said ring gear;

multiple ratio gearing comprising multiple sun gears, ring gears and planet pinions journalled on a pinion carrier, one member of said multiple ratio gearing being adapted to be connected to a driven member;

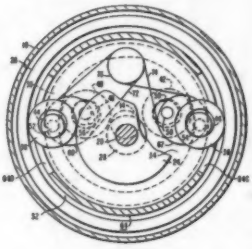
first clutch means for connecting a first input member of said multiple ratio gearing to said sleeve shaft and second clutch means for connecting a second torque input member of said multiple ratio gearing to said first shaft.

4,408,502

TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Mar. 10, 1981, Ser. No. 242,361
Int. Cl.³ F16H *3/44*
U.S. Cl. 74—789 **12 Claims**



1. A planetary type traction roller transmission comprising: input and output shafts; first and second traction ring structures supported by, and for rotation with, one of said input and output shafts; first and second sun roller structures associated with the other of said input and output shafts, said first and second sun roller structures being disposed within said first and second traction ring structures, respectively, with the axis of said first and second sun roller structures being in axially parallel alignment with, but spaced from, the axis of said traction ring structures such that annular spaces of varying width are formed between the first and second sun roller structures and, respectively, the first and second traction ring structures; planetary first and second traction rollers disposed in the annular spaces between said first and, respectively, second sun roller and traction ring structures; support means extending into said traction ring structure and supporting therein said first and said second traction rollers; and means for moving said first traction roller into a narrowing area of the annular space between said first sun roller and traction ring structures for firm frictional engagement therewith for the transmission of motion therebetween, and said second traction roller into a widening area of the annular space between said second sun roller and traction ring stuctures for disengagement therefrom, and, alternatively, for moving said first traction roller into a widening area of the space between the first and second sun roller and traction ring structure and said second traction roller into a narrowing area between said second sun roller and traction ring structure for engagement therewith and transmission of motion therebetween.

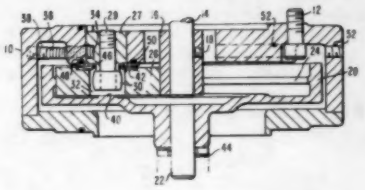
4,408,503

TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Mar. 6, 1981, Ser. No. 241,242
Int. Cl.³ F16H *13/06, 13/10, 13/00, 55/34*
U.S. Cl. 74—798 **8 Claims**

2. A traction roller transmission comprising: a traction ring having an inner traction race; a sun roller arranged within said traction ring, said sun roller having a traction surface spaced from the race of said traction ring to form an annular path therebetween; a number of motion transmitting traction rollers disposed in said annular path and being in engagement with said traction ring race and the sun roller surface for the transmission of motion therebetween; an annular guide structure arranged adjacent said traction rollers and in a plane normal to the axis of said traction ring, said traction rollers having annular side faces adjacent said annular guide structure, means for resiliently forcing said annular guide structure and said traction rollers toward each other permitting lubricant present in



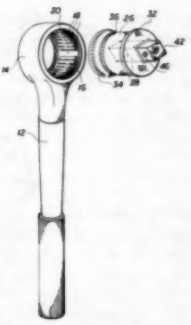
the transmission and adhering to said annular guide structure and the traction roller side faces, while being drawn between said annular guide structure and the roller side faces, to form a lubricant pad therebetween adapted to provide for a clearance whose size is dependent on the relative speed between said guide structure and the roller side faces thereby reducing high speed shear losses and permitting passage of particulate matter while firmly steering the traction rollers into parallel alignment with the traction ring.

4,408,504

SOCKET DRIVE

Raymond M. Dobosh, 5455 Brownsville Rd., Pittsburgh, Pa. 15236

Filed Jul. 24, 1981, Ser. No. 286,688
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—59.1 **2 Claims**



1. A socket drive comprising:

a handle having a cylindrical head at one end thereof;

a roller clutch that is secured within the cylindrical head;

a drive member concentrically maintained within the roller clutch and having a passage extending therethrough, said drive member and roller clutch being locked from movement in one angular direction and being substantially free turning in the opposite angular direction;

an extension member that is slideably lodged in the passage of said drive member, said extension being longitudinally moveable within said passage in one direction to expose a first end of the extension member for insertion into the socket and longitudinally moveable in the opposite direc-

tion to expose a second end of the extension member for insertion into the socket;

at least one detent ball adjacent each end of the slideable extension member and at least one detent socket adjacent each end portion of the passage of said drive member, said detent balls and detent sockets being positioned so that when one of the detent balls is in registry with one of said detent sockets one end of the extension member extends from the passage, and when a second detent ball is in registry with a second detent socket, the opposite end of the extension member extends from the passage; and

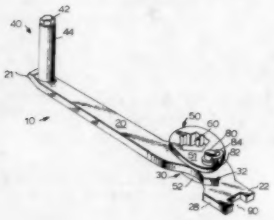
a keyway adjacent the passage of said drive member, said keyway having a stop member in the central region thereof, and first and second projections adjacent the slideable extension member, said first and second projections arranged to cooperate with said stop member to limit the longitudinal movement of the extension member in said passage.

4,408,505

MULTIPURPOSE RATCHETING WRENCH

E. Wayne Cook, 4455 Delespine Rd., Cocoa, Fla. 32922

Filed Sep. 10, 1980, Ser. No. 185,764
Int. Cl.³ B25B *13/28*
U.S. Cl. 81—98 **8 Claims**



1. A ratcheting wrench for turning components, such as fire hydrant valve stems, water meter valve stems, fire hose couplers, and the like, comprising in combination:

a lever having first and second ends, with said lever having a convexly curved arcuate portion defining first and second cam surfaces located generally along a longitudinal axis of said lever but spaced from said second end thereof; a pivot disposed along a center line of said arcuate portion and coupled to said lever adjacent said first and second cam surfaces;

a gripping head defining an aperture therein for receiving the component to be turned therethrough, with said gripping head being movably coupled about said pivot so as to move responsive to the magnitude and direction of the torque exerted on said first end of said lever between a tightening direction and position, wherein said gripping head closes upon said first cam surface, and an untightening direction and position, wherein said gripping head closes upon said second cam surface, so as to reduce in both of said positions the effective size of said aperture for gripping the component therein; and

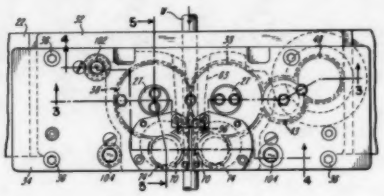
said second end of said lever including in a distended section thereof, notch means sized for coupling with and rotating the stem of a water meter valve, said notch means comprising in combination first and second opposing sides each defined by first and second surfaces with said first surfaces of said first and second opposing sides being generally parallel with each other but offset perpendicularly from each other generally by the thickness of the stem of the water meter valve to be rotated.

4,408,506

MACHINE FOR PRECISELY FEEDING AND TURNING AN AXIALLY MOVABLE NON-ROTATING WORKPIECE

Donald L. Coy, and Dale L. McEvers, both of Dayton, Ohio, assignors to H & H Industries, Inc., Dayton, Ohio

Filed Apr. 13, 1981, Ser. No. 253,706
Int. Cl.³ B23B *5/00*
U.S. Cl. 82—20 **20 Claims**



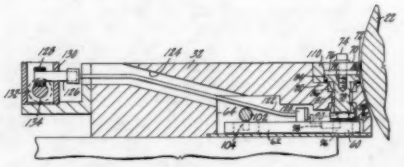
1. A machine adapted for precisely turning a cylindrical workpiece to a predetermined outside diameter, said machine comprising a forming head including an annular spindle supported for rotation on an axis, a plurality of angularly spaced tool elements mounted on said spindle for engaging the workpiece, means for driving said spindle, a plurality of workpiece feeding units spaced axially with said forming head disposed between two said feeding units, each of said feeding units including a pair of opposing feed rollers spaced to receive a workpiece therebetween, a pair of pivot members supporting said feed rollers for rotation on parallel spaced axes, means supporting said pivot members for pivotal movement on parallel spaced axes eccentric to the corresponding said axes of said feed rollers for changing the spacing between said feed rollers, means for simultaneously driving said feed rollers while said pivot members are pivoting, and a power actuated member disposed for simultaneously engaging and pivoting said pivot members in opposite directions while said feed rollers are driven to effect movement of said driven feed rollers between corresponding retracted positions and workpiece gripping positions for feeding the workpiece through said forming head in precise alignment with the axis of said spindle.

4,408,507

MACHINE TOOL INDEXING MECHANISM

Richard S. Szewczyk, Rochester, N.Y., assignor to USM Corporation, Farmington, Conn.

Filed Feb. 25, 1981, Ser. No. 238,015
Int. Cl.³ B23B *29/04*
U.S. Cl. 82—36 A **2 Claims**



1. A support for a cutting tool comprising: a circular insert having a cutting edge extending along the periphery of the insert, a holder to which the insert is secured, means mounting the holder for rotation in the support, a mechanism for incrementally indexing the holder, including a pawl and ratchet mechanism in driving relation to one end of the holder, an actuating arm carrying the indexing mechanism and swingable about the axis of rotation of the holder, a reciprocating device connected to the arm for swinging the arm to cause the pawl and ratchet mechanism to incrementally rotate the holder to present successive portions of the insert cutting edge, a control

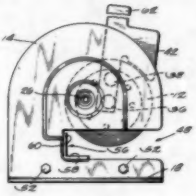
device to change the direction of rotation of the holder, a flexible shaft extending from an actuating means through the support to the control device, the actuating means being effective to rotate the flexible shaft, and a lever associated with the shaft to vary the effectiveness of the pawls of the indexing mechanism.

4,408,508

CUTTING TOOL HAVING CIRCULAR BLADE MOUNTED ON A PIVOTED LEVER

Robert R. Brester, New Berlin, and Thomas L. Roberts, Mukwonago, both of Wis., assignors to Velvac, Inc., New Berlin, Wis.

Filed Jan. 7, 1982, Ser. No. 337,573
Int. Cl.³ B23D *21/00, 17/00*
U.S. Cl. 83—397 **7 Claims**



1. In a cutting tool of the type having a circular blade having a center hole and a plurality of pivot holes spaced apart on a common radius and a handle fixed to the center hole and one of said pivot holes the improvement comprising,

spaced side plates,

a pivot shaft extending between the side plates,

said blade being mounted on said pivot shaft,

a throat in each side plate,

an anvil welded to each side plate at the rear lower corner of the throat and having a bed plate and a back plate on which and against which the material to be cut is positioned,

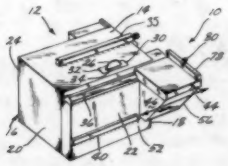
a blade guard depending from the handle and contoured to lie close to the adjacent circumference of the blade and extend across that throat when the handle is in its lowermost position.

4,408,509

CANTILEVERED SLIDING TABLE

Galen J. Winchip, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 27, 1981, Ser. No. 325,390
Int. Cl.³ B27B *25/10*
U.S. Cl. 83—435.1 **12 Claims**



1. A cantilevered sliding table, comprising,

an elongated main table including a generally horizontal top surface and a main frame for supporting said top surface,

an elongated guide rail,

means for supporting said guide rail adjacent one end of said top surface with said guide rail extended longitudinally of and parallel to said one edge,

an elongated thrust rail mounted on said main frame and extended longitudinally thereof in parallel and vertically spaced relation below said guide rail,

a sliding table,

a pedestal connected to and depending from said sliding table,

said sliding table having an elongated open bottomed guide way in the underside thereof for placement onto said guide rail for sliding movement thereon, and

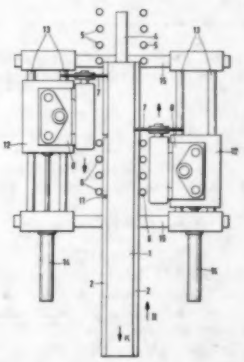
an elongated thrust surface on said pedestal at a position for sliding engagement against said thrust rail when said guide rail is received in said guide way whereby said sliding table and pedestal are slidably mounted in cantilevered fashion on said main table.

4,408,510

APPARATUS FOR CUTTING BOARDS FROM TREE TRUNKS

Alfred Reuter, Oberkirch, Fed. Rep. of Germany, assignor to Gebrüder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck", Oberkirch, Fed. Rep. of Germany

Filed Mar. 11, 1981, Ser. No. 242,475
Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020321
Int. Cl.³ B27M *1/08*; B25B *7/14*
U.S. Cl. 83—869 **9 Claims**

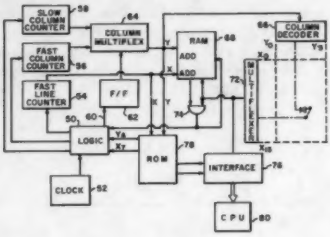


1. An apparatus for cutting boards from tree trunks, comprising means for making transversal cuts into a tree trunk to a predetermined depth; means for making longitudinal cuts into the tree trunk in a plane passing through the inner ends of said transversal cuts whereby the boards are separated from the trunk; and means for continuous advancing movement of the tree trunk in the longitudinal direction, said means for making transversal cuts including a pair of saw units positioned at two opposite sides of said trunk and each carrying a rotary saw, said saw units being arranged to move in said longitudinal direction with a speed corresponding to a speed of said advancing movement and in the transversal direction to produce said transversal cuts in said trunk.

4,408,511
ELECTRONIC MUSICAL INSTRUMENT

Christian J. Deforeit, Trossingen, Fed. Rep. of Germany, assignor to Matt. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,903
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023579
Int. Cl.³ G10H *1/34*
U.S. Cl. 84—1.01 **4 Claims**



1. In an electronic musical instrument having plural inputs, the inputs including key operated switches and operator adjustable input devices for setting additional switches in preselected positions, the state of the switch contacts being scanned to provide control signals for a tone generator, the improvement comprising:

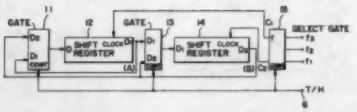
means connecting the contacts of the key operated and additional switches in a matrix defining rows and columns, the contacts of the key operated switches all being interconnected to define a first block within the matrix, sequential row and column scanning of said first block of the matrix sampling the state of only key operated switches, the contacts of the additional switches being connected to define at least a first additional block within the matrix, the first contacts of switches comprising said first additional block at least in part defining columns of the matrix which are not encompassed by the said first block, the scanning of a single row of the matrix including the scanning of second contacts of such additional switches; and

control means for determining the pattern of scanning of said matrix, said control means scanning said first matrix block at a first repetition rate and the additional switches at a repetition rate which is lower than the said first rate, said control means scanning at least a different one of the columns of the matrix which comprises said additional block after each complete scan of said first block of the matrix.

4,408,512
TONE SOURCE OF RHYTHM

Toshio Mishima, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Filed Aug. 14, 1981, Ser. No. 292,910
Claims priority, application Japan, Aug. 30, 1980, 55-119928
Int. Cl.³ G10H *1/42*
U.S. Cl. 84—1.03 **5 Claims**



1. A rhythm tone source comprising:

a plurality of shift registers, each register having a plurality of stages, a first input to one stage for a clock pulse, a second input to one stage for a feedback pulse and at least one output from one stage, each register being shifted from one stage to another by one of the clock and feedback pulses, said plurality of shift registers forming a noise generator for generating random pulses on said at least one output of at least one of said plurality of shift registers;

first means for providing one of a plurality of clock pulses to said first input of each of said shift registers; and

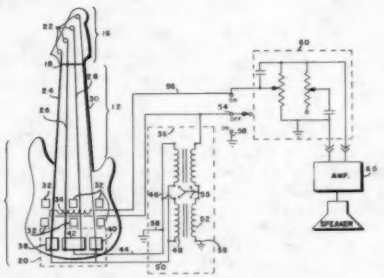
second means for selectively connecting said second input of each of said shift registers to said at least one output of any one of said shift registers;

wherein each shift register is shiftable by both said first and said second means.

4,408,513
DUAL SIGNAL MAGNETIC PICKUP WITH EVEN RESPONSE OF STRINGS OF DIFFERENT DIAMETERS

Martin R. Clevinger, 5410 Telegraph Ave. #4, Oakland, Calif. 94609

Filed Mar. 22, 1982, Ser. No. 360,181
Int. Cl.³ G10H *1/08, 3/18*
U.S. Cl. 84—1.15 **32 Claims**



1. Apparatus for use in stringed musical instruments, of the type having a plurality of strings which are positioned parallel to one another in a common string plane wherein the strings have a maximum excursion, for converting string motion into electrical signals, comprising

sensing coil means positioned with central axis perpendicular to the string plane, the coil means defining elongated top and bottom surfaces which are perpendicular to the principle axis of the coil means and which each cover a predetermined surface area, wherein the bottom surface is disposed transversely to the strings and lies in a first plane which is spaced apart from the string plane, and further wherein the top surface is aligned with the bottom surface and lies in a second plane which is spaced apart from the string plane and positioned between the string plane and the first plane;

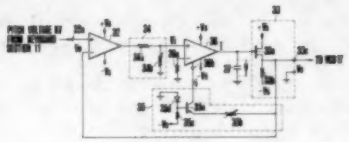
magnetic source means positioned about but spaced apart from the coil means, having an upper planar surface which defines a magnetic pole and a lower planar surface which defines an opposite magnetic pole, wherein the upper planar surface is positioned generally within the second plane and the lower planar surface is positioned generally within the first plane, the upper and lower planar surfaces each having an area substantially larger than the surface area of the top or the bottom surface of the coil means; and

elongated core means encompassed by the coil means and extending through the top and bottom surfaces of the coil, the core means comprising magnetically permeable material so that an effective magnetic field is formed which extends from the upper planar surface, through the strings, and thence through the core means and to the lower planar surface, the effective magnetic field having a volume in the region of the string plane which is greater than the volume occupied by the strings during maximum string excursion.

4,408,514
ELECTRONIC MUSICAL INSTRUMENT HAVING PORTAMENTS PROPERTY

Hideo Suzuki, Kosai, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation of Ser. No. 807,084, Jun. 6, 1977, abandoned. This application May 22, 1978, Ser. No. 908,489
Int. Cl.³ G10H 1/02
U.S. Cl. 84—1.24 11 Claims



1. In an electronic musical instrument including a capacitor which is charged with a pitch voltage to hold the same, and a voltage controlled type oscillator which is controlled by the terminal voltage of said capacitor for playing a portamento, the improvement which comprises a first mutual conductance converter responsive to an input voltage signal to produce a current signal for varying said capacitor terminal voltage, means for supplying the current signal of said mutual conductance converter to said capacitor, means for detecting said capacitor terminal voltage to produce a control voltage signal corresponding to said capacitor terminal voltage, means coupled to said mutual conductance converter and said detecting means for controlling the current signal of said mutual conductance converter in accordance with said control voltage signal so that said current signal is substantially directly proportional to said capacitor terminal voltage thereby causing said capacitor terminal voltage to vary exponentially with respect to time both in ascending and descending characteristics, and a comparator responsive to said pitch voltage and said capacitor terminal voltage for delivering to said mutual conductance converter an output voltage signal as said input voltage signal to said converter when said capacitor terminal voltage is in a predetermined relation in magnitude to said pitch voltage, said voltage controlled type oscillator having a substantially linear input-output characteristic thereby producing a tone signal having a frequency varying exponentially with respect to time in said both characteristics.

4,408,515
STRINGED INSTRUMENT CONVERSION KIT EMPLOYING COMBINED BRIDGE/TUNING MECHANISM

Michael N. Sciuto, 2310 Chetwood Cir., Apt. 101, Timonium, Md. 21093

Filed Jul. 13, 1981, Ser. No. 282,545
Int. Cl.³ G10D 3/04, 3/12
U.S. Cl. 84—267 23 Claims

1. A double stringed instrument, which comprises:
a body;
a neck extending from said body;
a head connected to said neck;
first and second sets of strings extending between said body and said head;
a first set of tuning keys mounted to said head for tuning said first set of strings;
means mounted on said head for terminating said second set of strings; and
a bracket mounted to said body, said bracket having bridge means mounted thereon over which said first and second sets of strings pass, said bracket also having a second set of

tuning keys mounted thereon for tuning said second set of strings.

4,408,516
GRAPHITE FIBRE VIOLIN

Leonard K. John, 6154 Slarfield Crescent, Mississauga, Ontario, Canada L5N 1X1

Filed Aug. 24, 1981, Ser. No. 295,942
Int. Cl.³ G10D 1/02
U.S. Cl. 84—275 15 Claims

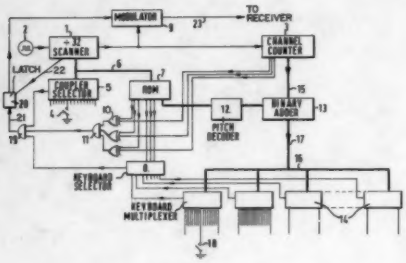
1. A violin-type musical instrument having an acoustic box generally of conventional violin acoustic box shape with a soundboard, a back, and sides, in which the soundboard comprises:
a first pair of sheets of unidirectional graphite fibres in a resin matrix, the fibres of the first pair of sheets substantially aligned with a longitudinal axis of the soundboard;
a second pair of sheets of unidirectional graphite fibres in a resin matrix, the fibres of one of the second pair of sheets oriented at an acute angle of predetermined magnitude relative to the longitudinal axis, the fibres of the other of the second pair of sheets oriented at an angle of substantially minus the predetermined magnitude;
the sheets bonded to one another in overlaid relationship with the sheets of each pair symmetrically placed about a hypothetical three dimensional curve of the general shape of the soundboard.

4,408,517

PIPE ORGAN

Leonard W. Ellen, "Briarmead", Chiltern Rd., Ballinger, Great Missenden, Buckinghamshire, England

Filed Aug. 28, 1980, Ser. No. 182,211
Int. Cl.[3] G10B 3/10
U.S. Cl. 84—345 8 Claims



1. A pipe organ comprising:
a pipe sounding section having ranks of pipes for sounding musical notes;
a note playing section having a plurality of playing keys allocated to individual notes and operable by a player of the organ;
a plurality of stops operable by the player of the organ for selecting correlations between keys played and pipes to be sounded, said stops selecting various pitch relationships between the keyboard and the pipes;
a receiving section;
means for deriving and transmitting electric signals providing information relative to the operative conditions of the stops and keys to said receiving section;
said receiving section comprising binary logic means arranged for addressing pipes and ranks in a predetermined sequence and arranged for examining the said transmitted signals, whereby to derive pipe and rank enable signals if for the particular pipe or rank address the said operative conditions of the stops and keys require the pipe or pipes to be sounded;
said receiving section having a programmed read-only memory (ROM) holding specifications for the rank coupling to be effected to meet the requirements of given stops;
a time division multiplex system for transmission of the signals to the receiving section;
a random access memory (RAM) in said receiving section providing temporary storage of data corresponding to the transmitted signals;
means for examining the RAM status while performing the pipe and rank address sequencing in order to derive the pipe and rank enable signals;
electromagnetic devices for controlling sounding of the pipes;
a pipe latch for energising the controlling device of each pipe, each pipe latch having a data input terminal for receiving signals indicative of whether the pipe is required to be sounded, a data output terminal for transferring the data requirement to the controlling device of the pipe, and an enable clock input terminal for receiving a clock signal, the pipe latch changing its state, if the data input signals specifies a change of state, only when the clock signal is received;
means connecting together the data input terminals of the pipe latches of any one rank to form a common data input line for that rank;
the clock input terminals of the pipe latches for pipes of corresponding pitch of all ranks being connected in common whereby an array is formed of clock lines each of which clocks all of the pipe latches of a given pipe pitch;
a de-multiplexing system arranged to connect the said clock lines one at a time to a master clocking line;
a binary counter forming part of said binary logic means, by which the de-multiplexing system is addressed, the counter operating at a rate permitting examination of all of the stops requirements during a time period allocated for the processing of signal data relevant to each pipe;
means for interrogating the RAM to determine the current state of a stop;
a binary adder having one set of inputs to which the address of the pipes as represented by the current state of the said de-multiplexing system is connected; and
means for feeding to another set of inputs of the adder, binary signals from the ROM which define the number of semitones difference between pipe pitch corresponding to the current state of said de-multiplexing system and the note pitch required whereby the output of the adder defines the address within a keyboard of a key which would sound the pipes of any rank at the pipe and stop addresses currently under examination.

5. A pipe organ comprising:
a pipe sounding section having ranks of pipes for sounding musical notes;
a note playing section having a plurality of playing keys allocated to individual notes and operable by a player of the organ;
a plurality of stops operable by the player of the organ for selecting correlations between keys played and pipes to be sounded, said stops selecting various pitch relationships between the keyboard and the pipes;
a receiving section;
means for deriving and transmitting electric signals providing information relative to the operative conditions of the stops and keys to said receiving section;
a time division multiplex system for transmission of the aforesaid electrical signals to the receiving section;
said receiving section comprising binary logic means arranged for addressing pipes and ranks in a predetermined sequence and arranged for examining the said transmitted signals, whereby to derive pipe and rank enable signals if for the particular pipe or rank address the said operative conditions of the stops and keys require the pipe or pipes to be sounded;
said receiving section having a programmed read-only memory (ROM) holding sepcifications for the rank coupling to be effected to meet the requirements of given stops, the ROM providing one bit of its output as a marker indicating when the last stop relative to a rank has been reached;
a random access memory (RAM) in said receiving section providing temporary storage of data corresponding to the transmitted signals;
means for examining the RAM status while performing the pipe and rank address sequencing in order to derive the pipe and rank enable signals;
electromagnetic devices for controlling sounding of the pipes;
a master latch having an input for receiving rank data signals from the ROM, the master latch having its output connected in common to the ranks of pipes
each rank of pipes having its own enable line which controls that rank of pipes;
sequencing means responsive to the marker bit of the ROM output for enabling the individual ranks in sequence; and
means for controlling the pipe controlling devices jointly through said master latch and said sequencing means.

4,408,518

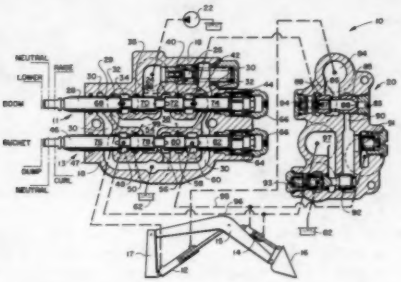
SERIES SELF-LEVELING VALVE

Robert McK. Diel, Hutchinson, and James P. Huebert, Halstead, both of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Mar. 17, 1981, Ser. No. 244,831

Int. Cl.³ F15B *13/06*

U.S. Cl. 91—31 **6 Claims**



6. A self-leveling system controlling a boom and bucket including boom and bucket cylinders controlled by separate boom and bucket directional control valves having motor ports in an open center series circuit having the boom control valve located upstream of the bucket control valve with a pressure source supplying the two control valves in a series path, the improvement comprising:

a flow dividing valve means connected to the rod end of the boom cylinder which splits the flow from the boom cylinder supplying a portion of the flow to the bucket cylinder to maintain the bucket level as the boom raises with the remaining flow connected to one of the boom motors ports whereby the bucket valve can be separately supplied concurrent with the boom valve and be supplied with oil so as to override the boom cylinder.

4,408,519

APPARATUS FOR SLICING BACON OR THE LIKE

Herman Schill, Kehl, Fed. Rep. of Germany, assignor to Maja Maschinenfabrik Hermann Schill GmbH, Kehl-Goldscheuer, Fed. Rep. of Germany

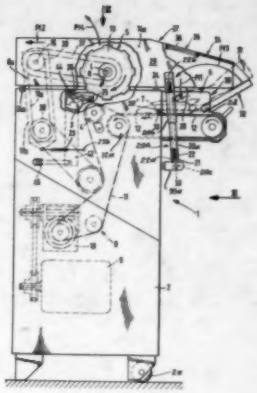
Filed May 21, 1981, Ser. No. 266,095

Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020351

Int. Cl.³ A22C *17/12*

U.S. Cl. 99—486 **26 Claims**

1. Apparatus for skinning or analogous treatment of bacon or like products, comprising a frame; a knife mounted in said frame; means provided in said frame for feeding the product along an elongated path toward and into the range of said knife; a hold-down device adjacent to said knife and said feeding means and arranged to engage a product which is advanced toward and severed by said knife; means for movably mounting said device so that the latter can perform movements in a plurality of directions in response to engagement by a product which is in the process of advancing toward and thereupon moves past said knife, said mounting means including a shround for said knife and said feeding means, at least one first lever articulately connecting said shroud to said frame at one side of said knife and a second lever articulately connecting said shroud to said frame at the other side of said knife, as considered in the direction of transport of products along said path; means for separably coupling one of said levers to said frame so that said shroud can be pivoted to a position in which it exposes said knife and said feeding means upon uncoupling of said one lever from said frame; and means for biasing said



device to a predetermined starting position which said device assumes in the absence of a product in said path.

4,408,520

APPARATUS FOR MEASURING PLATEN-PRESS BEND IN PLATEN PRESS

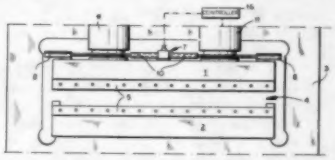
Hubert Wons, Brüggen, and Hans-Dietrich Sitzler, Nettetal, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,797

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 3101616

Int. Cl.³ B30B *7/02, 15/28, 15/34*

U.S. Cl. 100—93 P **10 Claims**



1. In a platen press having:

a press frame;

an upper press platen having at least one elongated beam;

a lower press platen having at least one elongated beam; and

means for urging said platens toward each other in a pressing direction to compress a workpiece therebetween, whereby said elongated beams may bend during such compression, an apparatus for measuring the bending of one of said beams, said apparatus comprising:

a flexible strand;

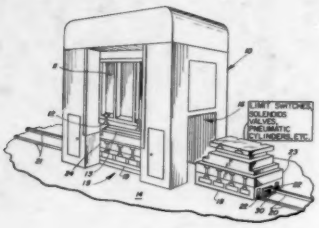
holder means at the ends of said one beam for gripping the ends of said strand and holding same straight and under tension; and

sensor means fixed on said one beam at a location between the ends of said one beam for measuring the displacement of said strand relative to said beam at said location during pressing, said sensor means lying wholly out of physical contact with said strand.

4,408,521
POWER PRESS WITH AUTOMATIC DIE CHANGING SYSTEM

William Schelli, Elmhurst, and William E. Sindelar, Darien, both of Ill., assignors to Danly Machine Corporation, Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,578
Int. Cl.³ B30B *15/06*
U.S. Cl. 100—229 R 8 Claims



1. An automatic die changing system for a power press having a press bed and carriers for transporting dies to and from a selected location in the press, said system comprising

a plurality of air lines and a plurality of electrical lines in the press bed for supplying compressed air and electrical power to the dies on said carriers, said air and electrical lines terminating at the surface of the press bed,

a normally closed valve at the end of each of said air lines, said valve being disposed below the surface of the press bed below and communicating with a plurality of apertures in the surface of the press bed,

electrical contact means at the end of each of said electrical lines at the surface of the press bed,

a plurality of connectors mounted on each of said carriers for movement therewith and positioned to register with said valves and electrical contact means at the surface of the press bed when the carrier is in its operative position in the press bed,

said connectors being adapted to automatically connect said air and electrical lines at the surface of the press bed with corresponding air and electrical lines for operating control devices associated with dies on the carrier, in response to the lowering of the carrier onto the press bed,

each of the connectors for said air lines having an actuator for automatically opening the valve of the corresponding air line in response to the lowering of the carrier onto the press bed and a fixed sealing ring around the periphery of the connector for engaging the surface of the press bed around said plurality of apertures when the carrier is lowered onto the press bed,

each of the connectors for said electrical lines having movable electrical contact means projecting downwardly from the carrier for engaging a corresponding one of said electrical contact means at the surface of the press bed, and biasing means for pressing each pair of engaged electrical contact means firmly against each other at the surface of the press bed when the carrier is lowered onto the press bed.

4,408,522
DEVICE FOR SECURING DIES

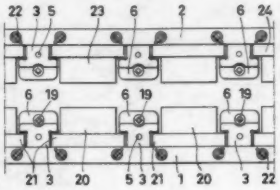
Yasuhide Yamane, Osaka, Japan, assignor to Teikoku Chuck Co., Ltd., Yao, Japan

Filed Nov. 9, 1981, Ser. No. 319,876
Int. Cl.³ B30B *15/02*
U.S. Cl. 100—295 1 Claim

1. A device for securing dies on a die mount of a press or the like, said device comprising:

a plurality of first clamps tiltably mounted on said die mount and formed with a shoulder at each side thereof, a projection at one side of the bottom, and a round opening, and provided with a spring at the other side of the bottom;

a plurality of second clamps tiltably mounted on said die mount and formed with a shoulder at each side thereof, a projection at one side of the bottom, and an opening of a trapezoidal shape, and provided with a spring at the other side of the bottom; and



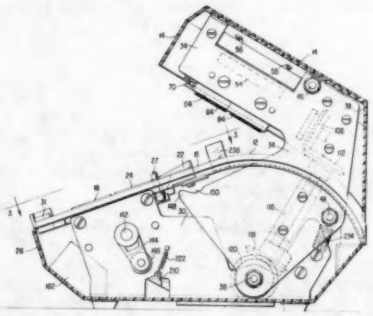
a camshaft extending through said first and second clamps and formed with a plurality of enlarged portions received in the openings of said first clamps and a plurality of spiral cams received in the opening of said second clamps;

said dies being placed between the rows of said first and second clamps and secured by said shoulders of said first and second clamps against the die mount when said camshaft is turned.

4,408,523
ELECTRIC IMPRINTER WITH ROLLER PLATEN POSITIONAL CONTROL

Erwin J. Senyitko, Eastlake, Ohio, assignor to DBS, Inc., Randolph, Mass.

Filed Aug. 11, 1981, Ser. No. 291,969
Int. Cl.³ B41L *47/46*
U.S. Cl. 101—56 3 Claims



1. An imprinter comprising:

a base;

a head pivotably mounted with respect to said base;

at least one roller platen rotatably mounted with respect to said head;

an electric motor;

means for connecting said motor to said roller platen for moving the roller platen from a home position to an actuated position and then back to the home position;

a data containing printing member disposed on said base;

a least one document disposed over said printing member on said base;

means for latching said head with said base;

means cooperating with said latching means for energizing said motor;

means for unlatching said head with said base prior to said

roller platen being returned by said motor to its home position in the event said motor becomes deenergized; and means for returning said platen to its home position upon re-energization of said motor independently of whether or not said head and base are relatched.

4,408,524

DEVICE FOR LOCKING AND ALIGNING PRINTING NUMERAL ROLLS AND A CONTROL CYLINDER

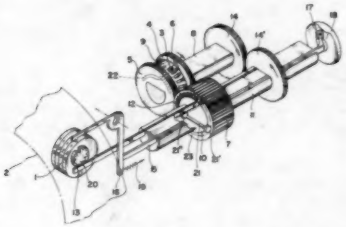
Klaus Nückel, Mülheim am Main, and Manfred Schleuchardt, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Postalia GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 176,054, Aug. 7, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,792

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2932425

Int. Cl.³ B41J *1/60*

U.S. Cl. 101—110 **7 Claims**



1. Device for locking and aligning a printing numeral roll and a control cylinder for internal counters in franking and value stamping machines, comprising a printing cylinder shaft, a shaped part disposed on said printing cylinder shaft, a toothed shaped part gear supported on said shaped part, a control cylinder shaft opposite said printing cylinder shaft, a toothed control disc gear being fixed on said control cylinder shaft and having a concave recess formed in the periphery thereof in which said shaped part gear is freely rotatable in a rest position, an extension disposed on said control disc gear, the control cylinder being rotatably supported on said extension; sprockets disposed on the control cylinder being settable by rotation of said shaped part gear in said rest position, a rack at least partially disposed in said printing cylinder shaft for setting the numeral roll in said rest position, the teeth of said control disc gear being engageable with the teeth of said shaped part gear for locking the control cylinder and blocking changing of the setting of said control cylinder sprockets in a denomination printing position, a slider guidable in said printing cylinder shaft, an angle lever connected to said slider for aligning and securing the numeral roll against change in said denomination printing position and for releasing the numeral roll in said rest position, and a cam for moving said slider between said positions.

4,408,525

ARRANGEMENT FOR LOW-VIBRATION SHEET TRANSFER BETWEEN PRINTING UNITS ON MULTI-COLOR PRINTING PRESSES

Herbert Rebel, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

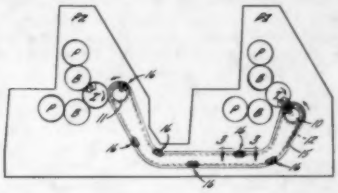
Filed Dec. 22, 1981, Ser. No. 333,380

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 8034521[U]

Int. Cl.³ B41F *21/00*

U.S. Cl. 101—183 **4 Claims**

1. An arrangement for the transfer and conveyance of sheets between first and second printing units of a multi-color press comprising, in combination, a receiving drum in the first printing unit, a feed drum in the second printing unit having an associated impression cylinder, an endless chain including links joined by pins and trained about the drums, a stationary guide rail following the path of the chain, a plurality of gripper carriages movable with respect to the rail, a carriage coupler for coupling each carriage to the chain for movement therewith, each coupler including a drive roller on the chain mounted outboard parallel to the pins thereof, each gripper carriage having a yoke for snugly embracing the drive roller in the driving direction, each carriage having a cam roller and the feed drum having a radially mounted drive fork defining a notch having a root for engaging the cam roller as the gripper carriage comes in the vicinity of the feed drum, the cam roller



being snugly fitted in the notch between the walls of the fork to achieve a condition of accurate register between the feed drum and the gripper carriage, (a) the root of the notch being lined with a pad of resilient material for resiliently pressing the carriage outwardly against the guide rail thereby to insure seating of the cam roller snugly fitted in the notch and (b) the yoke being resiliently mounted with respect to the carriage in the driving direction to permit slight accommodating movement of the carriage with respect to the chain so that each carriage at the time of sheet transfer is sequentially in a phase position which is dependent only upon the phase position of the feed drum for accurately phased transfer of the sheet thereon to the associated impression cylinder.

4,408,526

NO-PLAY GEAR DRIVE FOR PRINTING MACHINES

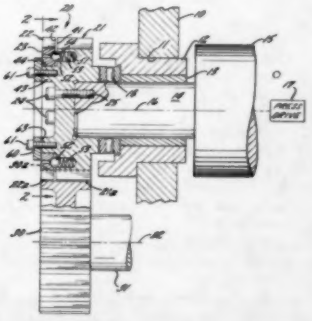
Josef Mathes, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.—Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 349,013

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112508

Int. Cl.³ B41F *13/00*; **F16H** *55/18*

U.S. Cl. 101—216 **3 Claims**



1. In a drive for a printing press having a drive shaft and a driven shaft, a main driving gear on the drive shaft and a driven gear on the driven shaft, the main driving gear having coaxially mounted thereon for limited rocking movement an

auxiliary driving gear the main and auxiliary driving gears having adjacent faces in closely spaced parallel relation and having identical profiles, the gears all being of the spur type with the teeth on the driving gears being in mesh with the teeth on the driven gear, a plurality of axially extending bores in the face of one of the driving gears and a plurality of matching conical recesses in the face of the other driving gear, balls fitted in the respective bores and having associated springs for pressing the balls outwardly in the direction of the recesses so that the auxiliary driving gear tends to be rocked into a detented position with respect to the main driving gear in which the matching bores and recesses are all in respective alignment, the bores and recesses being so angularly phased with respect to the gear teeth that when the auxiliary driving gear is in its detented position the teeth on the auxiliary driving gear are angularly offset by a small amount with respect to the teeth on the main driving gear with the result that the engaged teeth on the driven gear are pinched between the teeth on the driving gears for removal of play between the driving and driven gears, the auxiliary driving gear having a flat axially facing outer surface, and a retaining member rigidly fixed to the main driving gear and having a flat annular surface which is presented to the flat outer surface of the auxiliary driving gear to hold the latter captive against relative outward movement and to develop a frictional drag between the driving gears for damping relative oscillatory movement between them which tends to take place in the face of fluctuating load.

4,408,527

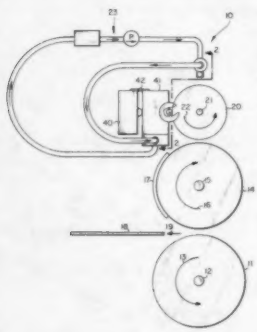
FLEXOGRAPHIC INK DISTRIBUTION SYSTEM

Clinton C. Bell, Charlotte, N.C. 28211

Filed May 26, 1981, Ser. No. 266,890

Int. Cl.³ B41F *31/06*; B41L *27/08*

U.S. Cl. 101—350 **5 Claims**



1. A system for applying and then removing in metering fashion ink from a roll comprising:

first means including ink and operable to drip ink atop said roll;

second means spaced from said first means operable to meter and remove ink from said roll and including a member with an outer surface with parallel ridges thereon separated by grooves to receive ink from said roll at a location aside said roll as said ridges contact said roll and remove ink therefrom;

third means connected to and between said first means and said second means to provide ink to said first means from said second means;

fourth means in contact with said second means and operable to move said member to and from said roll; and wherein:

said first means includes a main body with a main ink inlet leading into a hollow interior of said main body and a plurality of downwardly extending outlets opening adjacent said roll and spaced along the length of said main body, said third means includes a reservoir of ink and pumping means connected thereto, said third means further includes conduit means connecting said main ink inlet, pumping means and second means together directing ink from said grooves into said hollow interior and minimizing collection of said ink at said location, said member is a rod with a wire helically wound thereon, said rod is mounted adjacent said roll and is removable therefrom to install an identical rod with a different sized wire wound thereon depending on the amount of ink to be metered from said roll.

4,408,528

PRINTING EQUIPMENT WITH SCREW CONTROLLED DOCTOR BLADE

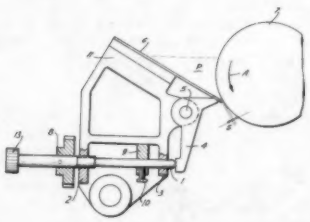
Hans Johne, Radebeul; Karl-Heinz Förster, Dresden; Arndt Jentzsch, and Wolfgang Müller, both of Coswig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Mar. 19, 1981, Ser. No. 245,672

Claims priority, application German Democratic Rep., Apr. 10, 1980, 220343

Int. Cl.³ B41F *31/02*

U.S. Cl. 101—364 **5 Claims**



1. In a printing-machine inking arrangement having a stationary part, a ductor roller and a doctor blade a marginal portion of which defines with the roller an inking gap, a combination comprising at least one ink-control screw operatively engageable with the marginal portion of the doctor blade and movable forwards and backwards along its axis to effect varying deflection of the marginal portion and thus change the width of the inking gap; elongated abutment means projecting radially from said screw and engageable at opposite sides thereof with the stationary part of the arrangement, depending upon the direction of rotation of the screw, so as to define two end positions for the axial movement of the screw and hence a maximum and a minimum width for the inking gap, said abutment means comprising an alongated abutment member which is removably mounted on said screw and having a free end portion for engagement with said stationary part, and said free end portion having a side which is leading when said screw turns in a sense causing it to advance and to reduce the width of said gap, said free end portion being formed with a slit extending lengthwise of the elongation of said abutment member parallel to said side and subdividing said free end portion into two parallel tongues spaced by said slit; and further comprising means for resiliently displacing one of said tongues transversely of said slit relative to the other of said tongues.

4,408,529

PLATE CLAMPING DEVICE

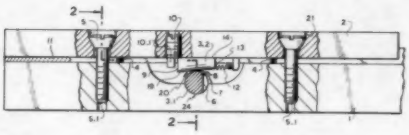
Hans Johne, Radebeul; Arndt Jentzsch, Coswig; Günter Schumann, Radebeul; Arnfried Jehring, Coswig, and Fritz Liebschner, Weinböhla, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Oct. 27, 1980, Ser. No. 201,321

Claims priority, application German Democratic Rep., Oct. 29, 1979, 216506

Int. Cl.³ B41F *15/04*

U.S. Cl. 101—415.1 4 Claims



1. A plate clamping device for clamping flexible printing plates on printing rollers in rotary printing machines, comprising a lower guiding rail and an upper guiding rail adapted to clamp a portion of a printing plate therebetween; at least two bolts spaced from one another and connecting said rails with freedom of relative movement between a plate-clamping position and a plate-releasing position, each of said bolts having a rounded head positioned in said upper guiding rail, whereby said upper guiding rail is adapted to pivot about said rounded heads when it is moved toward said plate-releasing position; biasing means permanently biasing said rails to said plate-releasing position; and clamping means located in the central region between said bolts and below said upper guiding rail and operative for applying to one of said rails midway between said bolts a clamping force which moves said one rail to said plate-clamping position, said clamping means including a rotatable clamping stud mounted in said lower guiding rail and extending normally to a direction of elongation of said lower guiding rail, a movable key arranged between said upper guiding rail and said stud, and an adjusting elenient for limiting the movement of said key, said clamping stud including a hex head part outwardly extended from said lower guiding rail and a substantially cylindrical part extending through said lower guiding rail, said head part being eccentrical relative to said cylindrical part, said cylindrical part being formed with a surface including a substantially flat portion, a transition curved portion and an arresting portion, said portions merging one into another in a circumferential direction, said key being biased by a supporting spring and having a rounded upper surface and a tapering lower surface adapted to engage with said surface of the cylindrical part so that said key becomes clamped between the stud and the upper rail when said stud is rotated to position said arresting portion against said tapering lower surface or released when said stud is rotated to position said flat portion against said tapering lower surface, the upper surface of said key being so dimensioned that between said upper surface and said upper guiding rail a clearance is provided when said lower tapering surface of said key is positioned against said flat portion of said stud, said lower surface being inclined in the direction toward said upper guiding rail.

4,408,530

AUTOMATIC PRINTING PLATE EXCHANGE SYSTEM

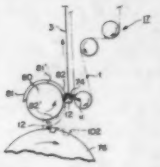
Tadashi Yano, and Noriyuki Hoshino, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,783

Int. Cl.³ B41F *27/12, 1/28*

U.S. Cl. 101—415.1 1 Claim

1. An automatic printing plate exchange system comprising plate holding means adapted to be mounted to a printing plate while presenting a resilient effect as a whole and having anchor-shaped engaging sections along its front and rear edges, send-out means for sequentially sending out plates, which have been preliminarily arranged in a predetermined order, up to predetermined position, conveyor means for receiving the plate sent out from said send-out means by engaging with the anchor-shaped engaging section of said plate holding means



and conveying the plate up to a predetermined position above a printing section, a printing cylinder on which said plate can be mounted, and delivery means for receiving the plate from the conveyor means by engaging with the anchor-shaped engaging section and delivering the plate to said printing cylinder.

4,408,531

BLANKET TENSIONING SYSTEM IN PRESS

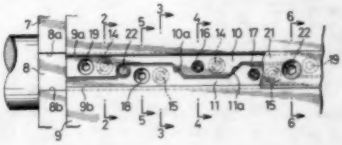
Yuichi Okamura, Tokyo, and Akitoshi Komatsu, Yokohama, both of Japan, assignors to Tokyo Kikai Seisakusho Ltd., Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,510

Claims priority, application Japan, Oct. 16, 1981, 56-153983[U]

Int. Cl.³ B41F *27/12*

U.S. Cl. 101—415.1 6 Claims



1. A blanket tensioning system comprising: a groove formed in the outer peripheral surface of a blanket cylinder to extend in the longitudinal direction of said blanket cylinder, said groove having parallel opposing walls; a pair of retainers, each of said retainers being attached to an opposite end of a blanket so as to maintain a portion of said blanket adjacent each said end within said groove, and said retainers having opposing surfaces provided with alternating convexities and concavities mating with each other whereby said retainers are free to slide up and down relative to each other, said retainers each having a width such that the total width of the mated retainers, with the attached blanket ends is substantially equal to the width of said groove; and a plurality of tightening bolts engaged with each of said retainers and being adapted to selectively displace either of said retainers toward the bottom of said groove independent of the other of said retainers.

4,408,532

LITHOGRAPHIC PRINTING PLATE WITH OLEOPHILIC AREA OF RADIATION EXPOSED ADDUCT OF DIAZO RESIN AND SULFONATED POLYMER

Joseph H. Incremona, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 145,025, Apr. 30, 1980, abandoned. This application Feb. 3, 1982, Ser. No. 345,338

Int. Cl.³ B41N *1/08*; G03F *7/08*

U.S. Cl. 101—456 7 Claims

1. A lithographic printing plate comprising a substrate having oleophilic image areas and hydrophilic background areas thereon, said oleophilic image areas comprising an actinic radiation-exposed adduct comprising the combination of a diazo resin having a plurality of pendant diazonium groups and a sulfonated polymer having a plurality of sulfonate groups, said sulfonated polymer being selected from the group consisting of sulfonated polyesters and sulfonated polyurethanes.

4,408,533

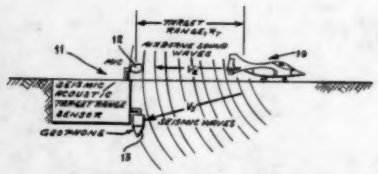
ACOUSTIC AMPLITUDE-THRESHOLD TARGET RANGING SYSTEM

Thomas E. Owen, Helotes; Sidney A. Suhler, and Wendell R. Peters, both of San Antonio, all of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 27, 1981, Ser. No. 286,820

Int. Cl.³ F42C *13/06*

U.S. Cl. 102—211 6 Claims



1. An acoustic amplitude-threshold system for generating munition actuation signals responsive to the time of closest approach of a moving target to within a set range limit of a munition, said acoustic-amplitude threshold system comprising:

an acoustic sensor circuit for sensing moving target sound waves and generating an amplitude function signal P in response thereto,

differentiating means receiving said amplitude function signal P and developing a first derivative signal $\dot{P}$ therefrom,

amplifier means having an amplification factor K for amplifying said first derivative signal $\dot{P}$, said amplifier means providing an amplified first derivitive signal $K\dot{P}$,

differencing means differencing said amplitude function signal P and said amplified first derivative signal $K\dot{P}$ and providing a difference signal $P-K\dot{P}$,

a threshold circuit providing reference level signals L, and

comparator means comparing said difference signal $P-K\dot{P}$ and said reference level signals L and generating munition actuation signals therefrom.

4,408,534

GAS GENERATING CHARGE AND A PROCESS FOR PRODUCING THE SAME

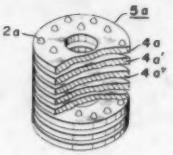
Ikuo Araki; Teruo Kanazawa; Shinji Ito, and Kenji Sumikawa, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,708

Claims priority, application Japan, Sep. 1, 1980, 55-119861

Int. Cl.³ C06B *45/00*, *21/00*

U.S. Cl. 102—288 20 Claims



1. A propellant charge capable of rapid combustion to generate a large volume of combustion gas in a short time, comprising: a stack of a plurality of relatively thin layers of relatively large surface area and which are joined to each other to form the propellant charge, said layers being made of a solid combustible propellant composition and having substantially parallel upper and lower surfaces, the lower surface of each of said layers being opposed to, spaced from and extending substantially parallel with the upper surface of the adjacent lower layer in said stack, each of said layers having a plurality of projections of relatively small surface area and height on at least one of said surfaces thereof and extending into contact with the opposing surface of the adjacent layer in said stack so that said layers are maintained spaced from each other, the surface areas of said projections being small relative to the surface areas of said surfaces of said layers to provide gaps of large area between adjacent layers so that said layers have large surface areas exposed for uniform ignition and burning to generate a large volume of combustion gas in a short time.

4,408,535

EXPLOSIVE CUTTING MEANS

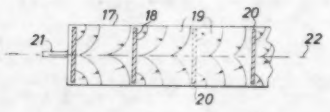
Sidney C. Alford, Corsham, England, assignor to Alflex Limited, Great Britain

Filed Jan. 13, 1981, Ser. No. 224,808

Claims priority, application United Kingdom, Jun. 28, 1980, 8021273

Int. Cl.³ F42B *1/00*

U.S. Cl. 102—305 26 Claims



21. A method of cutting using explosive material, the method comprising arranging explosive material in at least one strip in contact with a surface of a target to be cut on either side of an intended line of cut and so detonating the strip of explosive material that shock waves will be produced in the target material simultaneously on either side of the intended line of cut and will travel towards and coincide substantially at the intended line of cut after initiating detonation of the strip of explosive material from at least one end, and so controlling detonation of the strip of explosive material that said detonation proceeds both longitudinally and laterally inwardly of the strip and the shock waves produced thereby will coincide substantially at the intended line of cut with the line of coinci-

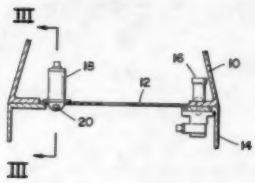
dence of the shock waves moving longitudinally along said intended line of cut.

4,408,536

METHOD OF RE-ENTRY BODY SEPARATION AND EJECTION

Frank Swales, deceased, late of Saratoga, Calif., and Doris Swales, heir, Santa Clara, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1977, Ser. No. 819,447
Int. Cl.³ F42B *15/00*
U.S. Cl. 102—379 **2 Claims**



1. A method of re-entry body separation and ejection from a rocket booster, the rocket booster and the re-entry body being held together by a plurality of separation nut and bolt catcher assemblies, comprising the steps of:

(a) igniting a pair of rockets arranged at two diametrically opposite positions on the base of said re-entry body to provide a thrust vector at an angle such that one component of said thrust vector provides the necessary separation velocity between said re-entry body and said rocket booster upon separation, and a second component of said thrust vector provides the spin-up of said re-entry body about the re-entry body axis upon separation;

(b) firing a plurality of separation nut assemblies simultaneously shortly after igniting said pair of rockets; and

(c) ejecting a plurality of attachment bolts released by the firing of said plurality of separation nut assemblies to a position within a plurality of respective bolt catcher assemblies,

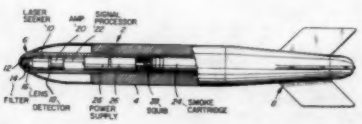
whereby said re-entry body and said rocket booster are separated without tip-off, and said pair of rocket motors are free to accelerate said re-entry body away from said booster while spinning-up said re-entry body for ballistic stability.

4,408,537

LASER-GUIDED BOMB TRAINER

Michel Fortier, Ste-Foy, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Quebec, Canada

Filed Jul. 14, 1981, Ser. No. 283,333
Claims priority, application Canada, Nov. 21, 1980, 365272
Int. Cl.³ F42B *25/18*
U.S. Cl. 102—395 **4 Claims**



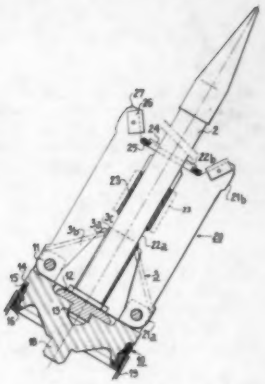
1. For use as a laser-guided bomb trainer, a practice bomb having an approximately similar ballistic coefficient to that of a laser-guided bomb, the practice bomb having a nose and tail section; a laser seeker being fixed to the body of the practice bomb within its nose section and having means to provide an internal signal upon target acquisition; a smoke cartridge being secured in the practice bomb to release a smoke producing chemical to the atmosphere when activated; and means associated with the laser seeker and smoke cartridge to activate the smoke cartridge upon receipt of the internal signal from the laser seeker.

4,408,538

LAUNCHING MECHANISM FOR SUBCALIBRE PROJECTILE

Jean Deffayet, and Etienne Lamarque, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Continuation of Ser. No. 107,681, Dec. 27, 1979, abandoned. This application Feb. 22, 1982, Ser. No. 350,657
Claims priority, application France, Dec. 28, 1978, 78 36677
Int. Cl.³ F42B *13/16*
U.S. Cl. 102—522 **9 Claims**



1. Launching mechanism for a finned subcalibre projectile to be fired from a gun barrel,

said launching mechanism comprising a pusher sabot fitted with a folded projectile centering means that unfolds as said projectile leaves the gun barrel,

characterized in that said folded projectile centering means comprises a plurality of rigid, thin, flat, radially extending and axially elongated blades paralleling a longitudinal axis of said projectile,

pivot means pivotally supporting said blades on said sabot adjacent one end thereof for swinging movement from a folded position to an unfolded radially extending position as said projectile is launched,

and retention means at the other end of said blades for securing said blades in their folded position prior to insertion in said gun barrel,

said blades being configured to abut in folded position against said projectile and said gun barrel.

4,408,539

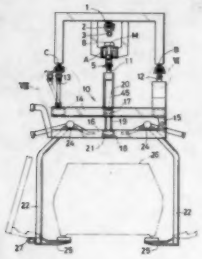
OVERHEAD CONVEYOR

Takao Wakabayashi, Shinsenri-Minamimachi, Japan, assignor to Nakanishi Metal Works Co., Ltd., Osaka, Japan

Filed Jul. 27, 1981, Ser. No. 287,113
Int. Cl.³ B61B *3/00*; E01B *25/24*
U.S. Cl. 104—89 **5 Claims**

1. An overhead conveyor comprising a main rail, right and left two auxiliary rails arranged on the opposite sides of the main rail and positioned at a higher level in an upward slope section of the conveyor line and at a lower level in a downward slope section of the conveyor line, relative to their immediately previous horizontal position based on the main rail, a main running body forwardly movable along the main rail, auxiliary running bodies forwardly movable along the auxil-

iary rails following the main running body, and a front suspender and right and left rear suspenders connecting the main running body and the auxiliary running bodies respectively to a hanger support positioned below the running bodies, the front and rear suspenders being pivotally movable forward and



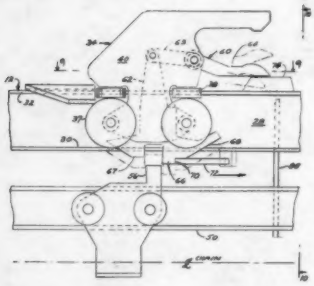
rearward and horizontally turnable, one of the right and left rear suspenders comprising a forward-rearward pivotable member and a sidewise pivotable member connected to the lower end thereof, whereby the main rail and the auxiliary rails can be arranged on arcs of three concentric circles in a curved section.

4,408,540

METHOD AND CONVEYOR SYSTEM FOR PROCESSING ARTICLES THROUGH SUCCESSIVE OPERATIONS

Clarence A. Dehne, Farmington Hills, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Filed May 13, 1981, Ser. No. 263,270
Int. Cl.³ B61B *10/00*
U.S. Cl. 104—172 B **7 Claims**



6. A driving trolley for moving an article carrier of a conveying system in a forward direction along a carrier track, said trolley having a body, wheels mounted on the body and adapted to engage the carrier track, and a driving dog carried by the trolley body for movement between driving and non-driving positions in which the driving dog is respectively engageable and not engageable by a pusher of a driven propelling member mounted below the carrier track, said driving dog being movable to non-driving position in response to engagement with a stop plate positionable below the carrier track in the path of forward movement of the driving dog; the improvement wherein:

the trolley body includes an upper portion projecting above the carrier track;

said driving dog and a holdback dog are formed integrally with a driving member having a stem portion movably mounted in the trolley body;

a lever pivotally attached to said upper portion of the trolley body has one arm connected to the stem portion of the driving member and a second operating arm projecting forwardly from said upper portion of the trolley body, said lever and the driving member being movable with the driving dog between said positions and being biased by weight to said driving position;

an upwardly inclined cam formed on the driving member forwardly of the driving dog and projecting below the carrier track is adapted to engage said stop plate and move the driving dog to non-driving position; and

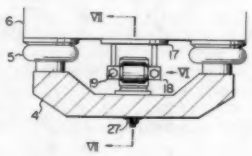
an abutment surface on said driving member rearwardly of said cam and forwardly of said driving dog is adapted to engage said stop plate for stopping the driving trolley with the driving dog in non-driving position and with the holdback dog in a non-engageable position relative to the stop plate and to a pusher.

4,408,541

BOGIE TRUCK CAR BODY SUPPORT SYSTEM

Hideo Takai, Hikari, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,262
Claims priority, application Japan, Jun. 11, 1980, 55-77739
Int. Cl.³ B61F *5/00*
U.S. Cl. 105—199 R **4 Claims**



1. A bogie truck car body support system, wherein a car body is supported on a truck frame through air springs of low transverse rigidity, comprising:

a link support attached to a portion of the underside of the car body which corresponds to a central portion of the truck frame;

a center pin mounted on the central portion of the truck framing with its longitudinal axis oriented vertically;

a link arranged longitudinally of the car body, one end of said link being connected to said link support by a first connecting means capable of transmitting longitudinally directed forces between the car body and the truck frame and accommodating relative vertical, transverse and rotary movements of the car body relative to the truck frame; and

the other end of said link being detachably connected to the center pin by a second connecting means capable of transmitting longitudinally directed forces between the car body and the truck frame and accommodating relative vertical and transverse movements of the car body and the truck.

4,408,542

CENTER SILL GONDOLA CAR

James C. Heap, Munster, Ind., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Jul. 25, 1977, Ser. No. 818,671
Int. Cl.³ B61D *3/00, 7/00, 17/00*
U.S. Cl. 105—406 R **9 Claims**

1. A gondola railway car comprising:

a car truck attached to each end of a continuous center sill,

a pair of generally vertical end panels,

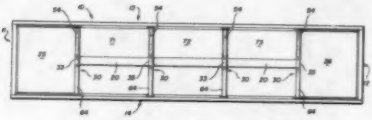
a pair of generally vertical side panels joined to the end panels,

a plurality of cross bearers extending from the center sill to a longitudinal chord at the bottom of each side panel,

a vertical plate joined to each cross bearer extending downwardly terminating in a peripheral edge corresponding to the shape of the trough,

a strip joined to each such plate peripheral edge and extending laterally therefrom between the longitudinal chords at the bottom of the side panels,

the trough being in sections supported at the ends by such strips,



a car bottom between the end and side panels having substantially flat portions over the truck and a longitudinal trough portion between the trucks and the flat bottom portions,

the trough portion having side edges joined to the side panel bottom edges and extending beneath the center sill, and

an end wall at each end of the trough extending to the adjacent flat bottom portion.

4,408,543

LABORATORY SUPPLY ARRANGEMENT

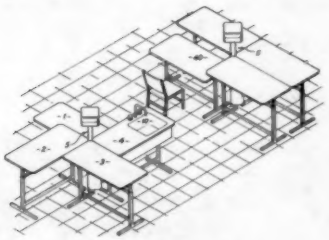
Brian C. Griffin, New South Wales, Australia, assignor to Brian Griffin Pty. Limited, New South Wales, Australia

Filed Apr. 15, 1981, Ser. No. 254,245

Claims priority, application Australia, Apr. 28, 1980, PE3307

Int. Cl.³ A47B *85/00*

U.S. Cl. 108—24 **5 Claims**



1. A laboratory supply arrangement comprising a services tower and more than two bench or table-like articles of furniture surrounding said tower, said services tower comprising a base, a narrow riser tube extending upwardly from said base above the upper surface of said table-like articles of furniture, and an outlet housing surmounting said tube, wherein electrical cables and at least some plumbed fluid services pass through said tube and into said housing, the terminals for said fluid services and electrical cables being mounted on the exterior of said housing and wherein a portion of the periphery of the upper surface of each of said table-like articles is shaped to be complementary with a corresponding portion of the cross-sectional shape of said tube whereby the surfaces of adjacent ones of said table-like articles can edge abut each other to provide a continuous working surface and also abut said riser tube.

4,408,544

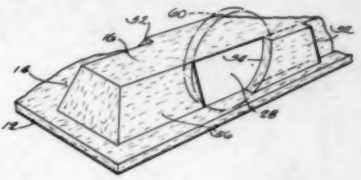
MOLDED WOOD PARTICLE PALLET HAVING INCREASED BENDING STRENGTH

Bruce A. Haataja, Lake Linden, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Aug. 12, 1981, Ser. No. 292,280

Int. Cl.³ B65D *19/24*

U.S. Cl. 108—53.3 **5 Claims**



1. A molded unitarily formed pallet comprising wood particles bonded together by a cured binder in compressed relation and forming a deck having an upper surface supporting a load, the deck including a lower surface and spaced apart opposite edges, and a plurality of elongated substantially parallel spaced channels supporting said deck, said channels extending from adjacent one of said edges to adjacent an opposite edge, and said channels each including spaced channel side walls extending downwardly from said deck and terminating in a planar bottom wall parallel to said deck, said side walls being integrally joined at their upper edges to said deck and being integrally joined at their lower edges to said bottom wall, said side walls including generally planar outer surfaces, and said bottom wall including an elongated lower surface, said pallet being adapted to be supported by said elongated lower surfaces of said channels, and a pair of spaced apart parallel passageways extending through said channels in a direction transverse to said channels and adapted to receive the forks of a forklift truck, said passageways being formed by openings formed in said channel side walls, said openings being aligned in the direction transverse to the direction of said channels, said deck and said elongated channels being formed by laying a loosely felted mat of wood particles in a press, and by compressing said loosely felted mat in said press, said mat including wood flakes mixed with a binder, and said wood flakes being thin and generally planar and being laid in felted relation so as to lie in substantially horizontal planes in interleaved relation, and said openings in said channel side walls being formed by pressing said mat in said press such that each of said side walls includes a pair of spaced apart projections projecting from said planar outer surface and by subsequently removing said pair of spaced apart projections.

4,408,545

SAFE, AND METHOD AND APPARATUS FOR BUILDING IT

Robert J. Lichter, 15571 Placid Cir., Huntington Beach, Calif. 92647

Continuation of Ser. No. 40,895, May 21, 1979, which is a division of Ser. No. 890,489, Mar. 27, 1978, which is a continuation-in-part of Ser. No. 758,587, Jan. 12, 1977, abandoned. This application May 18, 1981, Ser. No. 264,565

Int. Cl.³ E05G *1/00*

U.S. Cl. 109—50 **49 Claims**

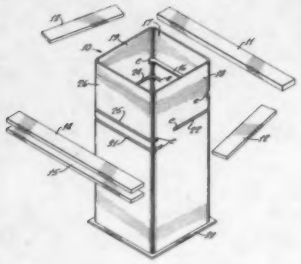
1. A safe, comprising:

(a) a liner which defines an opening therein, said liner having elongated slot means therein extending along substantial portions thereof,

(b) a mass of concrete engaged with the exterior of said liner and extending outwardly therefrom,

(c) bar means mounted in said slot means in said liner, said

bar means being strong, said bar means being partially inside said liner, within said opening, and partially outside said liner and embedded in said concrete, said bar means being a relatively tight fit throughout the length of said slot means whereby said bar means will be held in said slot means frictionally, with no need for adhesives, prior to



molding of the concrete, and whereby to minimize the possibility of grout flow through said slot means prior to setting of said concrete, and

(d) door means provided in said opening, said door means being strong, part of said door means being adjacent interior regions of said bar means, at least when said door means is in closed condition.

4,408,546

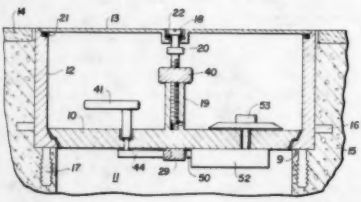
HINGELESS SAFE DOOR ASSEMBLY

Jacob D. Schmidt, Box 68-204 Railroad Ave., Wagon Mound, N. Mex. 87752

Filed Jan. 12, 1981, Ser. No. 224,488

Int. Cl.³ E06B *7/16*; E05G *1/04*; B65D *55/14*; E05C *5/04*

U.S. Cl. 109—75 **1 Claim**



1. A removable hingeless safe door for a safe compartment, comprising in combination, a lock assembly, a latch assembly with a plurality of interconnected latch bolts movable together in response to non-locked and locked positions of said lock assembly, said lock assembly and latch bolts being mounted on a circular plate having integrally secured thereto guide channels for movement of the latch bolts, said latch bolts being interconnected for movement together by means of pivotable levers connected to the bolts solely by socket joint structure, said door including a frame member for retaining the door in a recessed position in a wall or floor permitting access to the lock and latch assemblies, a cover plate fitting in the frame member to cover the door and provide a flush mounting member with a wall or floor in which the safe compartment resides, a watertight seal member between the cover plate and the frame member to keep the lock and latch assemblies free of water and a centrally mounted bolt flush with said cover plate extending into a mating receptacle on the circular plate to secure the cover against dislodging and to press against said seal, wherein the mating receptacle comprises handle structure for removing the circular plate.

4,408,547

HEATING BOILER

Ilpo Autere, Keksikuja 4, 86300 Oulainen, Finland

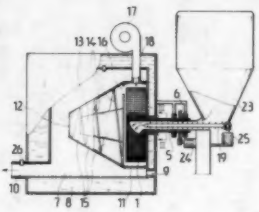
PCT No. PCT/FI81/00054, § 371 Date Mar. 8, 1982, § 102(e) Date Mar. 8, 1982, PCT Pub. No. WO82/00187, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 6, 1981, Ser. No. 359,668

Claims priority, application Finland, Jul. 7, 1980, 802162

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—234 **3 Claims**



1. A heating boiler intended for solid fuel and comprising a furnace, a cylindrical burning basket having a generally horizontal axis, said burning basket serving as grate of the furnace, and a hollow tube connected to the burning basket and extending in the direction of the axis of the basket to the outside of the boiler, said tube serving as means for communicating a rotary movement to the basket and forming a channel through which fuel is supplied to the basket.

4,408,548

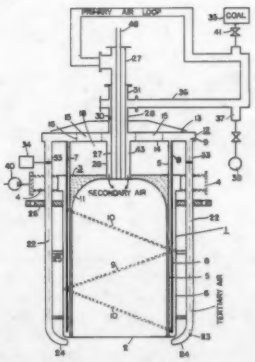
PULVERIZED COAL COMBUSTION METHOD AND APPARATUS

Jorg Schmalfeld, Mohnweg 7, Heiligenhaus; Werner Bruckner, Pfalzstr. 17a, Dusseldorf; Jorn Jacobs, Waldsaum 59, Essen; H. S. Greulich, Bremensfeld 105, Oberausen, and A. Schlutter, Rheinstr. 42, Kempen, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 30,737, Apr. 17, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 213,938

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **72 Claims**



1. A method of controlling coal combustion of finely ground coal, including anthracite coal and semi-bituminous coal with low inflammability in a flame chamber, comprising: injecting a mixture of pulverized coal with primary air at one end of said flame chamber; burning the coal below the slag melting point; supplying to said mixture a high amount of heat to ignite the fuel from the sides of said flame chamber; supplying cooling air for cooling said flame chamber, with at least a portion of said

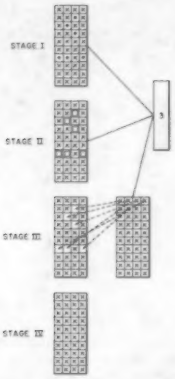
cooling air after being warmed up by said flame chamber being used for preheating said coal, wherein said step of supplying heat includes igniting coal from said injected mixture and circulating pulverized coal particles towards walls of the flame chamber to cause ignition of the coal particles.

4,408,549

METHOD FOR TRANSPLANTING OF SEEDLINGS

Bengt G. L. Qvarnström, Falun, Sweden, assignor to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed May 27, 1981, Ser. No. 267,883
Int. Cl.³ A01C *11/02*
U.S. Cl. 111—2 **13 Claims**



1. In mass-growing of seedlings in a greenhouse using seedling units of the type having a plurality of pots joined together in side-by-side relationship in an array to form a tray-like structure, where each pot is bottomless and comprises a plurality of resilient strips extending from the pot opening to converge towards the pot bottom side, the strips in use being rigid enough to hold and retain in use a lump of growth medium to support a seedling therein, a method of automatically inserting healthy seedlings together with growth medium into pots where seeds previously inserted into the growth medium did not germinate, said method comprising the steps of:

scanning the array of pots in each tray aided by a control unit, to identify the locations of pots wherein an acceptable seedling is absent;

automatically emptying the pot contents from said locations by using information regarding the identified locations; and

automatically inserting replacement seedlings with lumps of growth medium in emptied pot locations by taking replacement seedlings from a replacement seedling tray, whereby with the processed seedling units all having acceptable seedlings and no pots with ungerminated seeds, the utilization of the greenhouse space is improved.

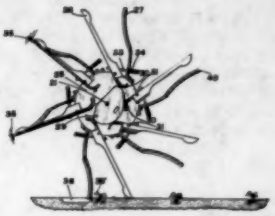
4,408,550

TRANSPLANTING IMPLEMENT

Wayne S. Ellis, 401 S. Marietta, Verona, Wis. 53593

Filed Dec. 7, 1981, Ser. No. 328,202
Int. Cl.³ A01L *11/2*
U.S. Cl. 111—2 **2 Claims**

1. In a transplanting machine of a type embodying pairs of mechanical fingers mounted on a hub to radially extend and be carried in a vertical plane by rotation of the hub, one finger of each pair being fixedly mounted and the other being pivotally mounted on said hub and driven by cam actuation to open and close with respect to the fixed finger for alternatingly holding and releasing plants to be planted, an improvement comprising the tipmost portion of said fixedly mounted mechanical finger bearing an extension of rubber-like yieldable material extending beyond said portion whereby said extension will flex and yield sufficiently while being drawn across the top of a transplant so as not to inflict damage to such



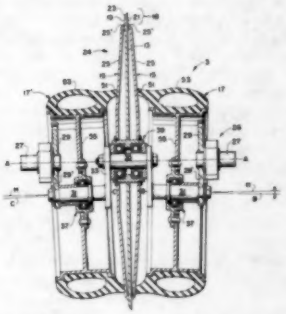
transplant and thereby enable transplants to be planted at closer spacing than would be possible by a fixed mounting finger being caused not to traverse across the top of a transplant.

4,408,551

ROW PLANTER

Phillip D. Keller, Fort Collins; Oren D. Urich, Windsor, both of Colo., and Deroy E. Mahagan, Everett, Wash., assignors to Heath Farm Equipment, Ft. Collins, Colo.

Filed Sep. 14, 1981, Ser. No. 301,640
Int. Cl.³ A01C *5/06*
U.S. Cl. 111—85 **20 Claims**



1. In a row planter having a furrow opening means mounted for rotation about a horizontal axis perpendicular to the travel direction of the row planter and further having a furrow forming shoe means following said opening means, the improvement comprising:

means for mounting said opening means and said shoe means with peripheral portions thereof overlapping when viewed from a direction substantially parallel to said horizontal axis of rotation of said opening means and wherein said opening means has a first profile when viewed from a point ahead of said row planter in a direction substantially parallel to said direction of travel of said row planter and said overlapping peripheral portion of said shoe means has a second profile, said second profile, when viewed from ahead of said row planter in a direction substantially parallel to said direction of travel of said row planter being smaller than said first profile, and said mounting means including means for mounting said shoe means wherein said second profile lies within said first profile when viewed from said point ahead of said row planter and wherein the remainder of said shoe means has at least a portion thereof with a third profile when viewed from said point ahead of said row planter in a direction substan-

tially parallel to said direction of travel of said row planter with said third profile extending outwardly of said first profile and forming the final shape of the furrow.

4,408,552

APPARATUS FOR AUTOMATICALLY PRODUCING COMFORTERS

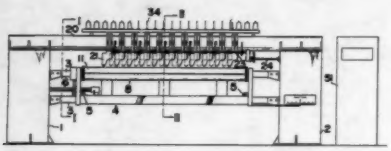
Atsushige Kondo, and Masakazu Kondo, both of 1126 Oaza Gamou, Yanagawa-shi, Fukuoka, Japan

Filed Jan. 2, 1980, Ser. No. 108,989

Claims priority, application Japan, Mar. 15, 1978, 53-30049; Jul. 14, 1979, 54-75399

Int. Cl.³ D05B *11/00, 21/00*

U.S. Cl. 112—119 **8 Claims**



1. Apparatus for automatically producing comforters comprising:

(a) two support structures transversely disposed in a parallel spaced-apart manner interposing a comforter material feeding path therebetween,

(b) guide rails bridging said two support structures at a desired level above and parallel to a floor surface, said guide rails extending perpendicular to said feeding path;

(c) a movable frame structure slidably mounted on said guide rails in a transverse direction relative to said feeding path, said movable frame structure including feed roller means for feeding said comforter material along said feeding path,

(d) a plurality of sewing machines stationarily disposed above said movable frame structure, said sewing machines being fixedly mounted on a transverse sewing-machine mounting frame which has both ends rigidly supported by said support structures,

(e) a first drive mechanism including a first servo motor for moving said movable frame structure in a transverse direction,

(f) a second drive mechanism including a second servo motor for driving said feed roller means in either a forward or a backward direction, and

(g) a third drive mechanism including a power-operated motor for operating said sewing machines and further including electromagnetic clutch means and electromagnetic brake means interposed between said power-operated motor and said sewing machines.

4,408,553

LOW TORQUE DIRECT DIALING PATTERN SELECTION MECHANISM

John Mihovch, Keansburg, and John Blackwood, Union, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 29, 1980, Ser. No. 221,177

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 A **6 Claims**

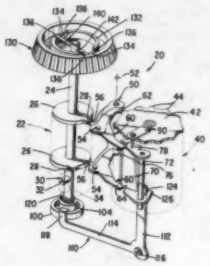
1. A sewing machine having stitch forming instrumentalities at least one of which partakes of vibratory motion in the formation of lockstitches,

a. a plurality of information cams moving in timed relation to said stitch forming instrumentalities,

b. a cam follower arranged for operational engagement with and movement by a selected one of said information cams,

c. coupling means between said cam follower and said at least one stitch forming instrumentality effective for imparting said vibratory motion to said at least one stitch forming instrumentality in response to said movement of said cam follower,

d. information cam selection means including an operator influencable element supported for one continuous operational movement, first means driven by said operator influencable element for effecting a first mode of operation rendering said coupling means ineffective, second means driven by said operator influencable element for effecting a second mode of operation to serially position said cam follower into operational engagement with said plurality of information cams one by one, a lost motion connection between said operator influencable element and said second means, said first means being driven only



during the lost motion movement of said operator influencable element provided by said lost motion connection and said second means being operative only after completion of the lost motion movement of said operator influencable element provided by said lost motion connection, said first means remaining effective after completion of said lost motion movement while said second means is effective, said operator influencable element being biased so that upon the absence of operator influence thereon said operator influencable element partakes of lost motion movement to render inoperative said second means and to cause said first means to render effective said coupling means.

4,408,554

AUTOMATIC NEEDLE THREAD CONTROL APPARATUS

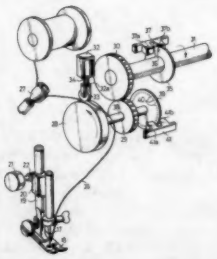
Michitaka Takiguchi, Anjo, and Fujio Horie, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jan. 28, 1981, Ser. No. 229,087

Claims priority, application Japan, Jan. 29, 1980, 55-9006

Int. Cl.³ D05B *49/00, 47/04*

U.S. Cl. 112—302 **4 Claims**



1. In a sewing machine having a thread supply, a thread carrying needle, a thread path between the supply and the needle, and a looptaker seizing thread from the supply for forming a loop of fixed size for forming stitches in cooperation

with the needle, an automatic thread handling system for controlling the thread comprising;

thread take-up means comprising reverse feed roller means positioned along said path and operable to positively move the thread in a direction for taking up the thread of said loop released from said looptaker only during discrete time periods,

controllable driving means operative to impart movement to said thread take-up roller means and to controllably vary the length of thread taken up,

sensing means for sensing the thickness of a workpiece being sewn and for generating thickness data corresponding to the sensed thickness,

means for generating stitch data corresponding to the distance between successive stitches to be formed in said workpiece,

means for generating a thread take-up start signal in timed relation to termination of the expansion of said loop, and

data processing means for calculating a desired length of thread to be taken up based on said thickness data and said stitch data, said data processing means being responsive to said thread take-up start signal for controlling the operation of said driving means to positively take-up the thread for a determined time period according to the desired length calculated thereby.

4,408,555

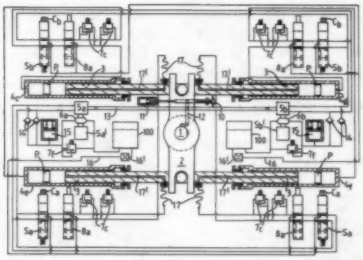
SHIPS STEERING GEAR

U. Soe Aung, 6A First Mansion, Jalan Daliah, Singapore

Filed Jun. 16, 1981, Ser. No. 274,365

Int. Cl.³ B63H *25/22*

U.S. Cl. 114—150 **8 Claims**



1. In a pressurised-fluid operated steering gear system for a ship comprising four pressurised-fluid actuators disposed in opposed pairs to control a common tiller arm, two pumps adapted selectively to supply pressurised fluid to actuators which are diametrically opposite across the rotary axis of the tiller arm while fluid is vented from the other two actuators, each said actuator comprising a chamber and means defining opposite end walls of the chamber relatively movable in response to variations of fluid pressure in the chamber and two supply lines opening into each chamber in spaced relation therealong between said end wall defining means and respectively connected to the pumps, the modification which comprises inserting in each chamber between the end wall defining means thereof an element forming a barrier between said supply line openings of the chamber which barrier element is movable in the chamber to close one or the other of said supply line openings in response to a pressure difference across said barrier element and the barrier elements collectively serving to isolate the pumps from one another so that failure of one pump or the pressurised-fluid circuitry associated therewith will not prevent operation of the steering gear solely by the other pump.

4,408,556

FENDER, RESPECTIVELY PLUG FOR A FENDER

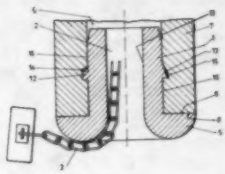
Adrianus W. van der Wiel, Rijswijk, Netherlands, assignor to Vredestein N.V., The Hague, Netherlands

Continuation of Ser. No. 31,103, Apr. 18, 1979, abandoned. This application Feb. 3, 1981, Ser. No. 230,993

Claims priority, application Netherlands, Apr. 25, 1978, 7804384

Int. Cl.³ B63B *59/02*

U.S. Cl. 114—219 **5 Claims**



1. A fender of the type to be suspended from a mooring place for ships, said fender comprising

a body of elastic material having an annular end wall and having a hole extending through said annular end wall and all through said body,

a plug removably secured in at least one of the end portions of said hole and including

a pin shaped portion extending into said hole fitted for securing in said hole, and

an annular head attached to said pin shaped portion, said head having a continuously curved outer surface substantially smoothly connected to the inner surface of said pin shaped portion, and substantially completely covering said annular end wall of said body,

said plug having an all the way through hole extending through said annular head and said pin shaped portion and concentric with said hole extending through said body,

a suspension means slidably passing over said annular head and through said pin shaped portion through said hole all through said body and having each of the ends of said suspension means secured to the mooring place at points spaced from one another,

whereby said plug protects the end of the fender from sliding wear by said suspension means and allows said suspension means to freely slide through the fender.

4,408,557

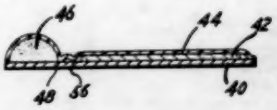
TIMER AND STORAGE CONDITION INDICATOR

Robert F. Bradley, and Lindell P. Bradley, both of New Buffalo, Mich., assignors to Micro-Circuits Co., Inc., New Buffalo, Mich.

Division of Ser. No. 49,082, Jun. 18, 1979, Pat. No. 4,292,916. This application Apr. 17, 1981, Ser. No. 255,119

Int. Cl.³ G01N *31/32*; G04F *1/00*

U.S. Cl. 116—206 **15 Claims**



1. A timer and storage conditions indicator adapted to indicate the passage of time integrated with various ambient physical environmental conditions, said indicator comprising a base layer of impervious material, a fluid carrier mixture containing a component the migration of which during operation of said indicator can be observed and indicates the passage of a prede-

termined length of time under predetermined ambient physical environmental conditions, said carrier mixture being in a stored condition in a relatively small area near one edge of said base layer until said indicator is activated, an absorptive layer on said base layer adapted to accept said carrier mixture within various elapsed time limits, a component in said indicator responsive to one or more of the ambient conditions, said component coacting with said fluid carrier mixture for causing the variation of said elapsed time limits by altering the rate of migration of said carrier mixture, a removable impervious barrier disposed between said carrier mixture and said absorptive layer, a cover layer disposed over and sealingly enclosing said absorptive layer and forming a capsule-like means for said carrier mixture near the one edge of said absorptive layer and means on said cover layer for indicating and for aiding in the indication of said migration rate within said elasped time limits.

4,408,558

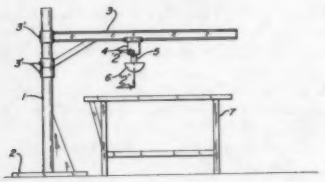
REPAIR APPARATUS

Dolan D. Faber, Akron; Richard G. Holmes, Wadsworth, and Joseph J. Varano, Hartville, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 370,873, Apr. 22, 1982. This application Jul. 21, 1982, Ser. No. 400,527

Int. Cl.³ B05C *11/02*

U.S. Cl. 118—59 **3 Claims**



1. An apparatus useful for the repair of molded thermoset FRP parts comprising a vertically disposed stand, an arm attached to said stand for vertical movement on and horizontal movement about said stand, pressure applying means slidably mounted on said arm for horizontal movement on said arm, said pressure applying means containing a vertically movable piston connected to a rotatable and tiltable pressure pad for applying pressure to an FRP part containing a defect having a repair material, an adjustable nest for substantially rigidly supporting a molded thermoset FRP part to be repaired under pressure from said pressure applying means, and means to provide heat to said FRP part where said pressure applying means is applied under pressure to the repair area of said part on said nest.

4,408,559

IMAGE FIXING DEVICE

Yoshinori Sugiura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,895

Claims priority, application Japan, Oct. 27, 1980, 55/153287[U]

Int. Cl.³ B05C *11/00*

U.S. Cl. 118—60 **20 Claims**

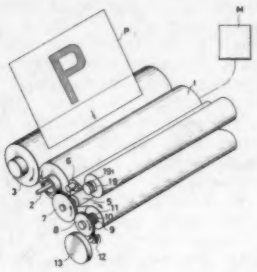
1. An image fixing device comprising:

a rotatable fixing member for fixing a toner image onto an image bearing member;

a web member retaining therein a parting agent for coating the parting agent on said fixing member and for cleaning the surface of said fixing member;

a first urging member for sandwiching said web member between it and said fixing member at a first region on the surface of said fixing member and urging said web member against the surface of said fixing member;

a second urging member for sandwiching said web member between it and said fixing member at a second region on the surface of said fixing member downstream of said first region with respect to the direction of rotation of said fixing member, said second urging member urging said web member against the surface of said fixing member; and



means for moving said web member in such a manner that said web member is moved at said first and second regions, in a direction opposite to the direction of rotation of said fixing member, whereby said web member mainly cleans said first region of said fixing member and mainly coats the parting agent at said second region of said fixing member.

4,408,560

APPARATUS FOR APPLYING SOLDER TO PRINTED CIRCUIT BOARDS

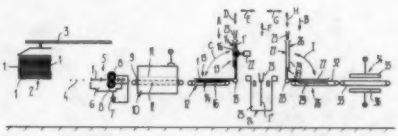
Hans-Peter Caratsch, Bremgarten, Switzerland, assignor to Sinter Limited, Bristol, England

Filed Oct. 2, 1980, Ser. No. 193,099

Claims priority, application Switzerland, Nov. 2, 1979, 9846/79

Int. Cl.³ B05C *3/09*; B23K *31/02*

U.S. Cl. 118—69 **23 Claims**



1. Apparatus for applying solder simultaneously to both sides of printed circuit boards, comprising:

means for holding a liquid solder bath;

means for moving the essentially vertically oriented circuit boards into and out of said solder bath;

a holder device having a substantially U-shaped cross-sectional configuration for receiving the printed circuit boards removed from the solder bath by said moving means and for transferring said boards into an essentially horizontal position;

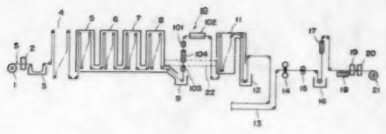
said holder device being movable between a receiving position where such holder device receives the essentially vertically oriented printed circuit boards and a transfer position where the printed circuit boards are arranged in an essentially horizontal plane; and

said holder device being provided with support element means upon which the printed circuit boards bear during their transfer into the horizontal position.

4,408,561
DUAL-PURPOSE PLANT FOR PRODUCING COLD ROLLED STEEL SHEET AND HOT-DIP GALVANIZED STEEL SHEET

Hideo Yokoyama, Ikuhashishi; Ichiro Shimbashi; Koichi Sakurai, both of Kitakyusyushi, and Munetsugu Matsuo, Kawasakishi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,316
Int. Cl.³ B05D 1/18
U.S. Cl. 118—72 26 Claims

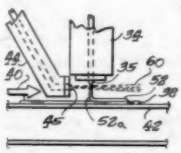


1. A dual-purpose production plant for producing either cold rolled steel sheets or hot-dip galvanizing steel sheets, comprising, successively disposed one directly after the other in series, a heating zone, a soaking zone, a primary cooling zone, an overaging zone having a controlled cooling facility therein, a hot-dip galvanizing means, an intermediate cooling means, a secondary cooling zone, a temper rolling means, and a chemical treatment means, and a bypass means for directly connecting said overaging zone and the secondary cooling zone with each other.

4,408,562
APPARATUS FOR APPLYING A COATING TO A MOVING SURFACE

James E. DeCamp, Olympia Fields; Raymond J. Arndt, Chicago, and Ronald L. Gruzewski, Tinley Park, all of Ill., assignors to Mactron, Inc., Worth, Ill.

Filed Dec. 21, 1981, Ser. No. 332,947
Int. Cl.³ B05B 12/04
U.S. Cl. 118—669 19 Claims

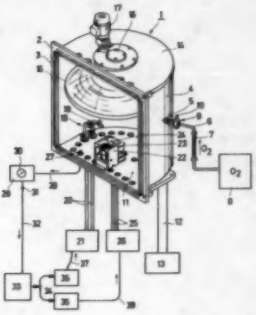


1. Apparatus for applying a coating to a surface of a workpiece moving in a predetermined direction and comprising: conveying means moving the workpiece in said predetermined direction with the workpiece surface exposed for coating; coating dispensing means having at least one coating outlet spaced in juxtaposition to said surface for dispensing the coating material to said surface as it traverses the coating outlet, dispensing control means operatively coupled with said dispensing means for initiating and terminating the dispensing of coating thereby as predetermined portions of said moving workpiece surface come into operative alignment with said coating outlet during traverse thereby, and air jet means for substantially preventing tailing of said coating on said surface following termination of dispensing thereof as the workpiece with its coated surface continues movement without substantial tailing of the applied coating, said air jet means including nozzle means juxtapositioned to said coating outlet for directing an air jet in the direction of movement of the surface being coated and upon the coating as it issues from the coating outlet so as to impart at least a component of acceleration to said coating in said predetermined direction.

4,408,563
APPARATUS FOR REGULATING THE EVAPORATION RATE OF OXIDIZABLE SUBSTANCES IN REACTIVE VACUUM DEPOSITION

Klaus-Jurgen Heimbach, Hattersheim, and Walter Zaltzke, Hanau, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Division of Ser. No. 65,013, Aug. 9, 1979, Pat. No. 4,287,224.
This application May 4, 1981, Ser. No. 260,484
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834813
Int. Cl.³ C23C 13/12
U.S. Cl. 118—692 3 Claims



1. Apparatus for regulating the evaporation rate of oxidizable substances in reactive vacuum deposition comprising a vacuum deposition chamber with at least one evaporation source connected to a power supply unit which is regulated by regulating means, an oxygen source, means communicating said chamber with said oxygen source, means for adjusting the supply of oxygen to a predetermined value, means for measuring the pressure in the vacuum chamber, and means intermediate said pressure measuring means and said power supply unit regulating means permitting regulation of the evaporation rate to any pressure changes such that the ratio of pressure to evaporation rate may be maintained substantially constant.

4,408,564
MILKING APPARATUS

Andrew J. Flocchini, 7050 Lakeville Hwy., Petaluma, Calif. 94952

Division of Ser. No. 60,253, Jul. 23, 1979, Pat. No. 4,263,874.
This application Nov. 26, 1980, Ser. No. 210,701
Int. Cl.³ A01J 5/04, 9/08
U.S. Cl. 119—14.08 2 Claims

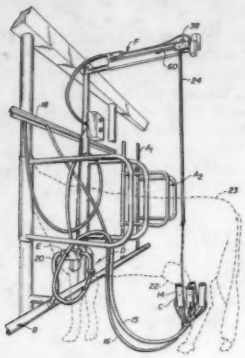
1. In a milking station having first and second stations for holding first and second side-by-side cows to said first and second milking stations and a teat cup assembly for milking cows at both said stations and means for retraction of said teat cup assembly from both of said milking stations; the improvement in said retraction means including:

a retraction arm medially pivotable along a vertical axis at a pivot support between said stalls adjacent and between the head portions of said first and second cows, said arm extending horizontally to a position overlying and along side of the bags of said cows;

a tensive support member extending between the outward end of said arm and said teat cup assembly for retracting said teat cup assembly from a milking position underneath said cow; and

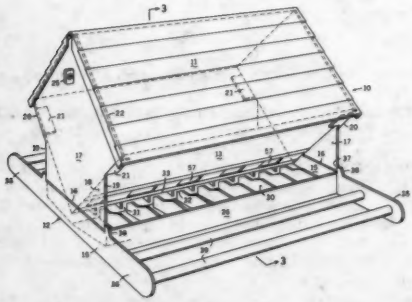
means for retracting said teat cup assembly operatively connected to said tensive support member and attached to

said arm for movement along said arm, said means for retracting causing upward and inward simultaneously



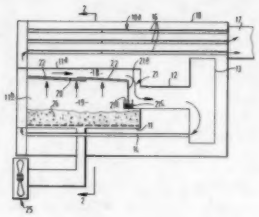
movement of said teat cup assembly from a milking position at or near the bag of said cow to a storage position between said milking stations.

4,408,565
FEED DISPENSER
Brad J. Kerbs, Eureka, Mo., and Kent J. Lanter, Millstadt, Ill., assignors to Ralston Purina Company, St. Louis, Mo.
Filed Mar. 8, 1982, Ser. No. 355,822
Int. Cl.³ A01K *39/01*
U.S. Cl. 119—52 R **10 Claims**



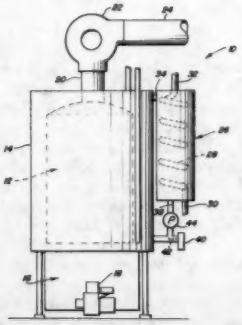
1. A feed dispenser for flowable particulate feed materials comprising a base, feed container and roof elements, the base including a tray with means for supporting the feed container in a dispensing position, the feed container having means separable in the dispensing position for rendering operative a plurality of openings in the container for dispensing feed into the tray, the base having opposed foldably connected end walls for releasably supporting the roof in overlying relation to the feed container.

4,408,566
BOILERS
Reginald D. Northcote, Lower Penn, and Mehdi G. Mehdi, Dudley, both of England, assignors to Thorn Emi Energy Developments Limited, Burton Works, England
Filed Jun. 9, 1981, Ser. No. 272,034
Claims priority, application United Kingdom, Jun. 10, 1980, 8018999
Int. Cl.³ F23C *11/02*
U.S. Cl. 122—4 D **9 Claims**



1. A boiler comprising a furnace box, having a peripheral wall, from which products of combustion pass to a smoke box wherein the furnace box comprises a lower compartment, means to establish a fluidized bed in the lower compartment, an upper compartment, an exit connected to said upper compartment for passage of products of combustion from said furnace box, means to isolate said lower compartment from said exit except by communication through said upper compartment and through a foraminous element located in the path of the products of combustion from said lower compartment to said upper compartment; said boiler being of the shell type comprising an outer shell containing a water/steam space of the boiler as well as said furnace box; said furnace box being generally cylindrical and having a longitudinal axis which extends horizontally; and said foraminous element being located above said fluidized bed and being generally part circular in cross-section, said foraminous element having lower ends which are connected to said wall of the box.

4,408,567
FURNACE CONSTRUCTION
Michael S. Morton, Box 923, Conway, N.H. 03818
Filed Feb. 3, 1981, Ser. No. 231,059
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—14 **16 Claims**



1. A fuel-fired hot water furnace, said furnace comprising:
fuel and air supply means for facilitating a combustion process in said furnace;
combustion chamber means in which said combustion process occurs;

said combustion chamber means including a horizontal primary combustion chamber in orthogonal communication with a secondary vertical combustion chamber, said combustion process being initiated in said primary chamber and continuing in said secondary chamber;

heat exchanger means for facilitating an exchange of heat between combustion gases generated in said combustion process and said water so as to heat said water, said heat exchanger means including a first set of surfaces forming an annular space means directing combustion gases upwardly along one side of said first set of said surfaces and providing a primary rise for flow of combustion gases between said first set of surfaces, a cylindrically-shaped outer water container means and cylindrically-shaped inner water container means defined by the proximate surface of said first set of surfaces and concentrically positioned within said heat exchanger means whereby said combustion gases must move upwardly along said surfaces, a second set of surfaces forming another annular space means for directing said combination gases downwardly along said second set of surfaces and providing a primary fall for flow of said combustion gases between said second set of surfaces and forming at least another surface of said inner water container means so as to facilitate exchange of heat between said combustion gases and said water;

combustion gas exhaust means for removing said combustion gases from said heat exchanger, said combustion gas exhaust means including a breaching tube through which said combustion gases are exhausted to a desired location, said combustion gas exhaust means further including a breaching damper positioned within said breaching tube for controlling a rate of flow of said combustion gases outwardly through said breaching tube, said breaching damper including an adjustable stop operable to limit positioning of said damper during operation of said furnace; and

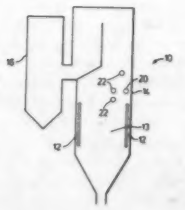
domestic hot water heating means, said domestic hot water heating means including a side container means including a hot water heater in fluid communication with said hot water contained in said furnace, said furnace water being utilized to heat a domestic water supply separately passing through said side container means including said domestic hot water heater.

4,408,568

FURNACE WALL ASH MONITORING SYSTEM

John R. Wynnyckyj, 711 Westmount Rd. W., Kitchener, Ontario; Edward Rhodes, 214 Willowdale Ave., Waterloo, Ontario, and Allan K. Chambers, 14324-50th Ave., Edmonton, Alberta, all of Canada

Filed Nov. 12, 1981, Ser. No. 320,604
Int. Cl.³ F22B *37/18*
U.S. Cl. 122—379 **20 Claims**



1. A method of monitoring the build up of ash on the inside walls of a coal-fired boiler, which comprises:

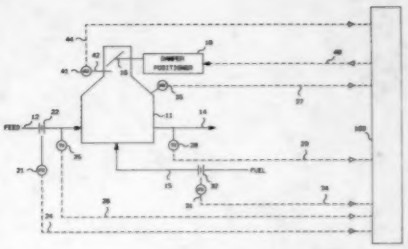
simultaneously determining the actual heat flux present in said boiler and the heat flux reaching the walls of said boiler, and determining the difference in heat flux value as a measure of the build up of ash on said inside walls.

4,408,569

CONTROL OF A FURNACE

Danny E. Novak, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 18, 1981, Ser. No. 322,614
Int. Cl.³ F22B *37/42*; F22D *5/00*
U.S. Cl. 122—448 R **17 Claims**



1. Apparatus for controlling the amount of oxygen supplied to a combustion zone in a furnace comprising:

means for establishing a first signal representative of the calculated efficiency of said furnace during a first time period;

means for establishing a second signal representative of the actual oxygen concentration in the furnace flue gas during said first time period;

means for establishing a third signal representative of the calculated efficiency of said furnace during a second time period, wherein said second time period is later in time then said first time period and wherein the amount of oxygen supplied to said combustion zone in said furnace has been changed after said first time period;

means for establishing a fourth signal representative of the actual oxygen concentration in said furnace flue gas during said second time period;

means for establishing a fifth signal representative of the desired oxygen concentration in said furnace flue gas during a third time period in response to said first, second, third and fourth signals, wherein said third time period is later in time then said second time period;

means for establishing a sixth signal representative of the most current measurement of the actual oxygen concentration in said furnace flue gas;

means for comparing said fifth signal and sixth signal and for establishing a control signal which is responsive to the difference between said fifth signal and said sixth signal; and

means for manipulating the amount of oxygen supplied to said combustion zone during said third time period in response to said control signal.

4,408,570

TUBE HANGER FOR STEAM GENERATOR

Manuel F. Dominguez, and Joseph E. Ferguson, both of Bakersfield, Calif., assignors to Shell Oil Company, Houston, Tex.

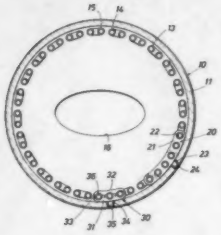
Filed May 26, 1982, Ser. No. 382,339
Int. Cl.³ B22B *37/24*; F28F *9/02*
U.S. Cl. 122—510 **3 Claims**

1. A tube hanger for the longitudinal steam generating tubes in a cylindrical radiant steam generator comprising:

a leg member having an I-beam cross section, said leg member having sufficient length to extend through the cylindrical insulating wall of the steam generator, the outer end

of said leg terminating in an anchoring flange disposed at right angles to the longitudinal axis of the leg;

a tube support member having a plurality of curved surfaces formed thereon, said curved surfaces conforming substantially to a portion of the outer diameter of the steam generating tubes of the steam generator, said tube support means being attached to the inner end of said leg;



a removable yoke member having a plurality of curved surfaces formed thereon, said curved surfaces conforming substantially to a portion of the outer diameter of the tubes of the steam generator, said removable yoke member being fastened to said tube support means with the curved surfaces on each being aligned so that said surfaces substantially surround the tubes of the steam generator.

4,408,571

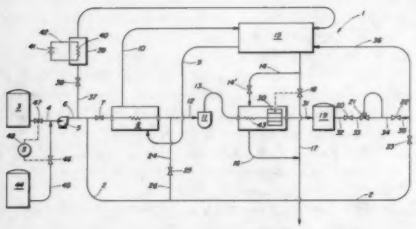
METHANE COLD STARTER IN ALCOHOL FUEL TREATMENT AND DISTRIBUTION METHOD

Robert G. Jackson, Weston, Conn., and Heeyoung Yoon, McMurray, Pa., assignors to Conoco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 286,992, Jul. 27, 1981, Pat. No. 4,366,782. This application Jun. 16, 1982, Ser. No. 388,839

Int. Cl.³ F02B *43/00*; F02M *27/02*

U.S. Cl. 123—3 **8 Claims**



1. A method of cold start-up for an engine fueled by alcohol or hydrogen dissociated from alcohol comprising the sequence of steps as follows:

(a) providing a first vaporizer means, a second vaporizer means, a methanation catalyst within a first reactor means, and a dissociation catalyst within a second reactor means,

(b) vaporizing alcohol in said first vaporizer means to form a first alcohol vapor,

(c) contacting said first alcohol vapor and said methanation catalyst to form methane,

(d) passing said methane to said engine,

(e) starting said engine,

(f) vaporizing alcohol in said second vaporizer means to form second alcohol vapor,

(g) contacting said second alcohol vapor and said dissociation catalyst in said second catalytic reactor to form hydrogen and carbon monoxide,

(h) conveying said hydrogen and carbon monoxide to said engine to sustain the operation of said engine.

4,408,572

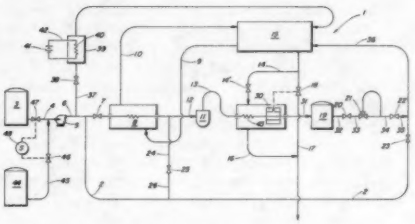
ETHER COLD STARTER IN ALCOHOL FUEL TREATMENT AND DISTRIBUTION APPARATUS AND METHOD

Heeyoung Yoon, McMurray, Pa., and Robert G. Jackson, Weston, Conn., assignors to Conoco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 286,992, Jul. 27, 1981, Pat. No. 4,366,782. This application Jun. 16, 1982, Ser. No. 389,131

Int. Cl.³ F02B *43/00*; F02M *27/02*

U.S. Cl. 123—3 **9 Claims**



1. A fuel treatment and distribution apparatus for use with an internal combustion engine comprising

an alcohol fuel storage means,

an electrical power source means,

a vaporizer means,

a catalyst containing start-up reactor means, said catalyst containing reactor comprising an electric resistance heating means connected to receive electrical power from said electrical power source means and a dehydration catalyst,

and a by-pass conduit means,

said alcohol storage means being in fluid flow communication with said vaporizers means,

said vaporizer means being in fluid flow communication with said dehydration catalyst containing start-up reactor means,

said catalyst containing start-up reactor means being in fluid flow communication with said internal combustion engine,

said alcohol storage means being in fluid flow communication with said internal combustion engine through said by-pass conduit means circumventing said start-up reactor means.

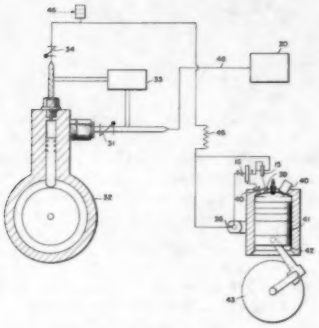
4. In a fuel treatment and distribution process comprising providing an alcohol fuel storage means, a first catalyst containing reactor, an internal combustion engine, said first reactor containing a dissociation catalyst, passing alcohol from said storage means through said first reactor to form a combustible gaseous mixture comprising hydrogen, and passing said hydrogen to said engine wherein the improvement comprises providing a second catalyst containing reactor for start-up in fluid flow communication with said fuel storage means and said engine, said second reactor containing a dehydration catalyst, passing said alcohol through said second catalyst to form ether, and passing said ether along with said alcohol delivered through said by-pass conduit means to said engine, whereby said engine may be started using ether formed in said second reactor and said alcohol, and then operated using hydrogen formed in said first reactor.

4,408,573

SYSTEM AND METHOD FOR SUPERHEATED-WATER INJECTION SYSTEM (SWIS)

William B. Schlueter, Rte. 3, Box 174, Big Pine Key, Fla. 33043, and Ignacio D. Debuque, Jr., 9 Ermin Garcia St., Cubao, Quezon City, Philippines

Filed Oct. 9, 1981, Ser. No. 310,208
Claims priority, application Philippines, Oct. 14, 1980, 24719
Int. Cl.³ F02M *25/02*
U.S. Cl. 123—25 P 2 Claims



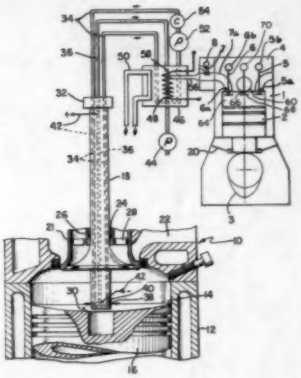
1. The design and system for a superheated-water injection system (SWIS) which superheats water under pressure conditions to temperatures above 212° F. (100° C.) while preventing it from boiling, and injects such superheated water into the engine combustion chamber some micro- or milli-seconds after the point of ignition thus flashing the injected superheated water into superheated steam and generating a usable workforce incremental to and separate from that produced by combusting the fuel itself, the principal components of such superheated water injection system consisting of: (a) a water reservoir, (b) a water line, (c) a high-pressure, high-temperature water pump powered either by a motor or from a power takeoff run by the engine, such pump being designed both to move water from the reservoir through the whole circuit and to build up and maintain pressure on the water contained in the line in excess of that existing at any time within the combustion chamber of the engine to which the SWIS device is intended to be attached, so as to prevent the water, though superheated, from flashing into steam until it is finally injected into the combustion chamber; (d) an accumulator to maintain water pressure in the circuit at the desired level at all times; (e) a water bypass system equipped with pressure-control valves to prevent water pressure inside the water line from building up beyond a designated maximum, (f) exchangers to transfer heat from the radiator water and/or the exhaust manifold gases and/or an electric heating device to the water passing through the water line; (g) a power unit connected directly to the engine combustion chamber and actuated by the engine's combustion gases a designed to force a timed and metered volume of superheated, pressurized water through the injector into the combustion chamber some micro- or milliseconds after the point of ignition, such power unti consisting of (i) a cylinder and a piston actuated by pressure from combustion gases; (ii) return springs positioned at the top and lower ends of the cylinder piston; (iii) check and pressure-central valves to prevent the contained water from being ejected or backing up until the desired pressure is brought to bear on the piston; (iv) a manually adjusted injection timing-control system consisting of an up-and-down screw installed at the top of the cylinder with a pointer and lock-in device; (v) an automatic injection timing-control system actuated by a hydraulic pump powered from the main engine by belt, gear or any means direct power takeoff and connected to the power piston by a pipe, check valves and pressure relief system designed to maintain a desired pressure directly proportional to the engine speed that is brought to bear on the upper return spring that the distance travelled by piston; and (h) an injector, turned and actuated by the power piston positioned to discharge superheated water into the engine combustion chamber.

4,408,574

METHOD AND APPARATUS FOR FORMING FUEL-AIR MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Josef Schaich, 118 Oschle, 7906 Markbronn, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 275,775
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846416
Int. Cl.³ F02M *67/02*
U.S. Cl. 123—26 3 Claims



1. A mixture formation device in an internal combustion engine comprising: fuel vaporizing means for producing fuel vapor, engine nozzle means connected to said vaporizing means by a fuel vapor passage for introducing fuel vapor into a combustion chamber, and an air pump means connected to said fuel vapor passage for introducing pressurized air into said fuel vapor passage at a selected time in the engine cycle, said air pump means comprising a cylinder and a plunger therein, valve means connecting said cylinder with said combustion chamber, means synchronized with said engine for reciprocating said plunger in said cylinder, an auxiliary chamber communicating with said cylinder, and a valve means for opening and closing the communication between said chamber and cylinder on selected strokes of said plunger.

4,408,575

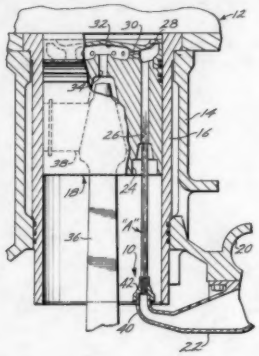
NOZZLE ASSEMBLY FOR CONTROLLED SPRAY

Floyd H. Clairmont, Jr., Peoria, and Russell R. Graze, Jr., Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00092, § 371 Date Jan. 23, 1981, § 102(e) Date Jan. 23, 1981, PCT Pub. No. WO82/02575, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 23, 1981, Ser. No. 278,511
Int. Cl.³ F01P *3/10*
U.S. Cl. 123—41.35 1 Claim

1. In a nozzle assembly (10) adapted for controllably spraying a cooling liquid toward the underside of a reciprocating engine piston (18), the piston (18) defining an upper annular chamber (28) and a vertical passage (26) connected to the chamber (28), said nozzle assembly (10) having an inlet portion (40) which includes an inner circular wall (44) defining a straight cylindrical opening (46) therethrough, an outlet portion (42) adapted to be connected to said inlet portion (40) comprising:

said outlet portion (42) having a central straight cylindrical primary outlet passge (62) of a length (L) and of a uniform circular cross-sectional diameter (D_1) which is less than the cross-sectional diameter of the inlet portion opening (46), the primary outlet passage (62) being positionable for axial alignment with the opening (46) and adapated to communicate a first liquid flow from said opening (46) through the outlet portion (42) and outwardly thereof at a first velocity alignably into the passage (26) and upper chamber (28) of the piston (18), said outlet portion (42) further including a plurality of straight cylindrical secondary passages (66) axially parallel with and symmetrically encircling the primary outlet passage (62), the secondary passages (66) each being of the same axial length (L) and having a preselected uniform circular cross-sectional diameter (D_2), said secondary passages (66) positioned so



that their radially outer edges are adpated to be flush with the inner wall (44) of the inlet portion opening (46) and the radially inner edges of said secondary passages (66) are equally spaced a preselected radial separation distance (S) from the periphery of the primary outlet passage (62), the radial separation distance (S) being at least equal to one half of D_2, the first ratio of L/D_1 falling within a range of 3.75 to 6.0 and the second ratio of L/D_2 falling within a range of 7.5 to 13.0, the secondary passages (66) adapated to communicate a plurality of second liquid flows from said opening (46) through the outlet portion (42) and outwardly thereof alignably into the passage (26) and upper chamber (28) of the piston (18) at a second velocity less than said first velocity so that the first and second liquid flows combine outside of the nozzle assembly (10), form, and maintain a substantially columnar and diametrically compact liquid spray pattern (A).

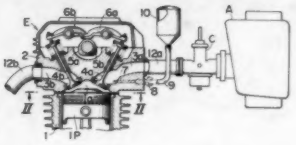
4,408,576

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Hiromu Sakaoka, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 176,542
Claims priority, application Japan, Aug. 10, 1979, 54-101258
Int. Cl.³ F02B *31/00*
U.S. Cl. 123—52 MB **16 Claims**

1. In an intake system for an internal combustion engine of a type having a combustion chamber, an intake passage and an exhaust passage opening to the combustion chamber, and an intake valve and an exhaust valve disposed in said intake and exhaust passages to open and close the respective passages, said intake valve having a longitudinal axis and a peripheral edge, the improvement comprising a closed supply chamber of a predetermined volume, and control passage means connected at one end to the supply chamber and being open at another end to a lower surface of the intake passage upstream of and in the immediate vicinity of the intake valve and being substantially directed at an angle offset from the longitudinal axis of the intake valve to a juncture formed upstream of the intake valve where the peripheral edge of the intake valve meets the intake passage, whereby intake mixture is drawn from the



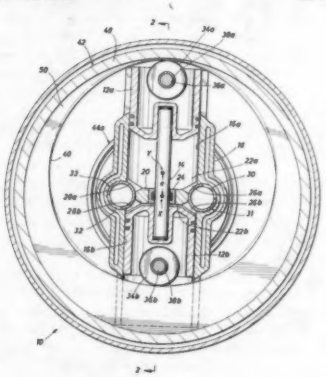
portion of intake passage lying adjacent the intake valve into the supply chamber through the control passage means upon closure of the intake valve, and the mixture in the supply chamber is fed to the combustion chamber through the control passage means upon opening of the intake valve.

4,408,577

ROTARY ENGINE

Henry R. Killian, 915 Longview, Sugarland, Tex. 77478

Filed Sep. 2, 1980, Ser. No. 182,856
Int. Cl.³ F02B *75/22*
U.S. Cl. 123—55 AA **21 Claims**



1. A rotary internal combustion engine apparatus comprising:

(a) a stationary cylinder block having at least one pair of opposed cylinder bores;

(b) at least one pair of opposed piston means for reciprocating operation within said one pair of opposed cylinder bores;

(c) a piston connecting means comprising a rod connecting at least one pair of opposed piston means together;

(d) a dividing wall between said pair of cylinder bores, having a reduced bore concentric with said cylinder bores for communication of said piston connecting means therethrough;

(e) inlet and exhaust means communicating with each cylinder bore and comprising:

(i) a cylinder inlet port and a cylinder exhaust port communicating with each cylinder bore, generally positioned adjacent to opposite ends of said dividing wall;

(ii) first and second valve bores oriented generally transversely to said cylinder bores and communicating with said cylinder inlet and exhaust ports, respectively, and aligned with said dividing wall;

(iii) first and second valve shaft bores, concentric with said first and second valve bores, passing through said stationary cylinder block;
(iv) a first rotatable valve means contained within said first valve bore for timed admission of combustible fuel mixture;
(v) a second rotatable valve means contained within said second valve bore for timed extraction of exhaust gases;
(vi) rotatable valve actuation means for timed rotation of said first and second rotatable valve means; and
(vii) opposing cylinder inlet and exhaust ports intersecting respective ones of said cylindrical valve bores and displaced from one another;
(f) a cam follower means at each extremity of said one pair of opposed piston means;
(g) at least one rotatable eccentric cam means coacting with said cam follower means;
(h) a rotatable frame means secured about said cam means;
(i) an output drive means connected to said rotatable frame means; and
(j) a housing means for enclosing said rotatable frame means and stationary cylinder block.

4,408,578

PISTON ENGINE AS A COMBUSTION ENGINE OR AS A COMPRESSOR WITH OPPOSED CYLINDERS

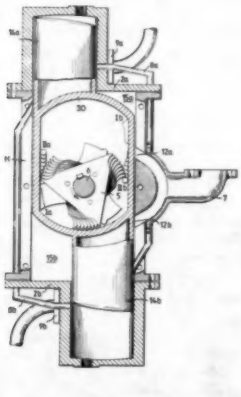
Siegfried Konther, and Siegfried Konther-Chamorro, both of Cerro Cora y Azara, San Lorenzo, Paraguay

Filed Dec. 2, 1980, Ser. No. 212,290

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3010362

Int. Cl.³ F01B 9/00

U.S. Cl. 123—56 R **2 Claims**



1. A piston engine comprising a housing for opposed cylinders with reciprocating pistons therein adapted during engine operation to effect rotation of an engine shaft mounted in said housing, in which two opposedly working pistons are rigidly connected to each other by a hollow carrier through which the engine shaft extends, said carrier having interior wall portions that move tangentially to the engine shaft on opposite sides thereof during reciprocating movement of the pistons and carrier, said wall portions being provided with a main series of staggered projections thereon and said engine shaft being provided with a first corresponding stack of toothed discs fixedly mounted thereon, said main series of staggered projections being formed and arranged to successively engage and push the teeth of said first corresponding stack of toothed discs to apply rotational torque to the engine shaft as the carrier reciprocates, the number of teeth on a single disc corresponding to the number of working strokes of a piston for each revolution of the shaft.

4,408,579

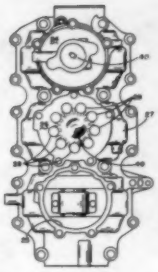
INDUCTION SYSTEM FOR A TWO-CYCLE ENGINE

David W. Kusche, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 28, 1981, Ser. No. 335,017

Int. Cl.³ F02B 33/04

U.S. Cl. 123—73 V **13 Claims**



1. A two-cycle, crankcase compression engine comprising:
(A) a crankshaft;
(B) a crankcase surrounding said crankshaft;
(C) an induction passage for supplying air-fuel mixture to said crankcase, said induction passage having an axis transverse to the axis of said crankshaft;
(D) a reed valve means mounted in said induction passage, said reed valve means including a valve seat member having a plurality of valve ports arranged in a generally circular pattern equidistant from the axis of said induction passage, and a plurality of reed valve members, each normally closing one of said valve ports and opening in response to low pressure within said crankcase to admit air-fuel mixture to said crankcase;
(E) a flow modifying body mounted in said induction passage immediately upstream from said reed valve means; and
(F) a carburetor mounted on said engine, said carburetor having a barrel, said barrel having an axis aligned with the axis of said induction passage.

4,408,580

HYDRAULIC VALVE LIFT DEVICE

Toru Kosuda; Yasuhiro Takeuchi, both of Okazaki; Noboru Matsubara, Susono, and Masaaki Takizawa, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 15, 1980, Ser. No. 178,285

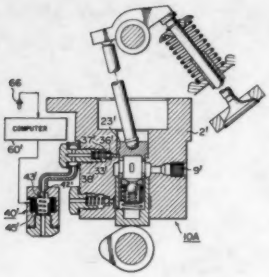
Claims priority, application Japan, Aug. 24, 1979, 54-108471; Aug. 28, 1979, 54-109510

Int. Cl.³ F01L 1/34

U.S. Cl. 123—90.16 **4 Claims**

1. In a hydraulic valve lift device including a lifter having therein an oil pressure chamber for introduction of oil and slidably disposed in a cylindrical bore of a housing with its one end engaged by a cam on a cam shaft and a plunger slidably disposed in said lifter for opening and closing an intake or exhaust valve, of which a valve lift is made variable depending on the rotational speed of said cam due to discharge of oil from said oil pressure chamber through a throttling port, the improvement comprising a braking chamber defined by a flange portion of said plunger and said cylindrical bore, a slit adapted to communicate said braking chamber with an oil feed chamber of said plunger for flow-in of oil and to be reduced in its opening area depending upon the downward movement of said plunger, a relief valve provided in association with said braking chamber for controlling an oil pressure therein so as to cause it to be below a set value, a sensor for producing an

electric signal representing a braking force generated by said braking chamber, an electromagnetic means for regulating a set working pressure of said relief valve, and a computer for energizing said electromagnetic means depending upon the output signal of said sensor to control said relief valve such that its set working pressure corresponds with a desired value, and wherein said computer comprises an amplifying circuit for



amplifying the output of said sensor, an A-D converting circuit for A-D converting the output of said amplifying circuit, a ROM circuit for outputting a predetermined value depending upon the output of said A-D converting circuit and an output circuit for D-A converting and amplifying the output of said ROM circuit, said output circuit being adapted to output to said electromagnetic means.

4,408,581

DEVICE FOR CONTROLLING THE SPEED OF TRAVEL AND REGULATING THE IDLING SPEED OF AUTOMOTIVE VEHICLES WITH AN OTTO ENGINE

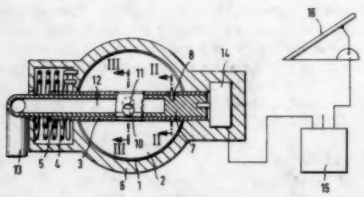
Manfred Pfalzgraf, Frankfurt am Main; Eckhart Kern, Hofheim, and Harald Collonia, Glashütten, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,884

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040144

Int. Cl.³ F02M *3/00*

U.S. Cl. 123—339 **13 Claims**



1. In a system for controlling the vehicle speed of travel as well as for regulating the idling speed of automotive vehicles having an Otto engine, comprising an actuator which adjusts the position of a regulating element for control of the vehicle speed as a function of the position of a desired-value transmitter as well as a closure element which determines the throughput passage cross section of a by-pass, the latter connecting a region in front of the regulating element with a region behind the regulating element, which closure element is displaceable by an automatically controlled actuator, the improvement wherein

said first-mentioned actuator and said automatically controlled actuator constitute a single actuator means common both for the controlling of the vehicle speed of travel and for regulating the idling speed,

said single actuator means being for actuating the closure element for regulating the idling speed, in a first operating range and being for operating the regulating member for controlling of the vehicle speed of travel in a second operating range.

4,408,582

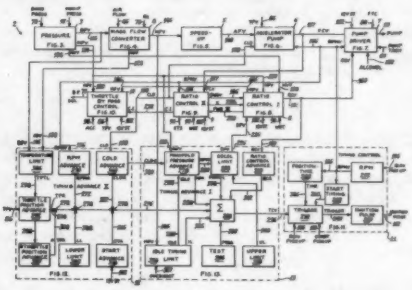
ELECTRONIC ENGINE CONTROL

James W. Merrick, El Paso, Tex., assignor to General Dynamics Corporation, St. Louis, Mo.

Division of Ser. No. 899,355, Apr. 24, 1978, Pat. No. 4,284,053. This application Jan. 30, 1981, Ser. No. 229,924

Int. Cl.³ F02B *3/00*; F02P *5/04*; F02M *39/00*

U.S. Cl. 123—415 **9 Claims**



1. In an electronic controller for an internal combustion engine having an ignition system responsive to ignition pulses for producing ignition sparks in combustion chambers and wherein rate of air flow into the intake manifold of the engine is measured by producing an air flow signal systematically related to the rate of air flow, and rate of fuel flow into the engine is measured by producing a fuel flow signal systematically related to the rate of fuel flow, said electronic controller including means responsive to engine parameters for producing a ratio control signal corresponding to a respective air/fuel ratio, and means responsive to said air flow signal, said fuel flow signal and said ratio control signal for controlling fuel flow as to make the ratio of air flow to fuel flow substantially equal to said respective air/fuel ratio, said controller further including means for generating a reference timing signal indicative of movement of the engine to a reference position in the engine cycle, timing advance control means for producing a timing advance control signal corresponding to a respective angular displacement of said engine from said reference position, and means responsive to said reference timing signal and said timing advance control signal for producing ignition pulses at positions relative to said reference timing position systematically related to said timing advance control signal, the improvement wherein said timing advance control means comprises RPM advance means responsive to engine speed for producing an RPM timing advance signal systematically related to engine speed and corresponding to a respective timing advance systematically increasing with increase in engine speed, manifold pressure advance means responsive to manifold pressure for producing a manifold pressure timing advance signal systematically related to manifold pressure and corresponding to a respective timing advance systematically decreasing with increase in manifold pressure, ratio control advance means responsive to said ratio control signal for producing a ratio control timing advance signal systematically related to said ratio control signal and corresponding to a respective timing advance systematically increasing with said increase in respective air/fuel ratio, output means responsive to applied timing advance signals for producing a timing ad-

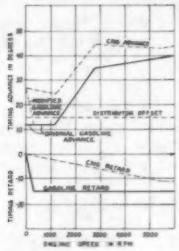
vance control signal corresponding to the sum of the respective timing advances, and means for applying said RPM timing advance signal, said manifold pressure timing advance signal and said ratio control timing advance signal to said output means.

4,408,583

IGNITION TIMING CONTROL

James W. Merrick, El Paso, Tex., assignor to Automatic Controls, Corp., El Paso, Tex.

Filed May 26, 1981, Ser. No. 267,011
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—415 **6 Claims**



1. For use in an ignition system for a spark ignited internal combustion engine having a plurality of cylinders, which system includes timing means responsive to engine position for producing a timing signal indicative of engine position in an engine cycle, means responsive to said timing signal for initiating a spark in a respective cylinder of the engine, and programmed timing control means responsive to engine speed for controlling the occurrence of said timing signal relative to engine position in systematic relation to engine speed to provide such spark at a timing angle appropriate for a first fuel at each respective engine speed: a timing control for an alternative fuel comprising means responsive to engine speed for producing a controlled timing angle interval systematically related to engine speed, and means responsive to said controlled timing angle interval and said timing signal for changing the timing angle of such spark by said controlled timing angle interval to provide such spark at a timing angle appropriate for a second fuel at each respective engine speed.

4,408,584

AIR-FUEL RATIO CONTROL SYSTEM

Hideo Yabuhara, Musashino, and Ichiro Kudo, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Jul. 14, 1981, Ser. No. 282,984
Claims priority, application Japan, Jul. 16, 1980, 55-97358
Int. Cl.³ F02B *3/00*; F02M *7/00*
U.S. Cl. 123—440 **5 Claims**

1. In an air-fuel ratio control system for an internal combustion engine having an intake passage and an exhaust passage, detector means for detecting the concentration of a constituent of exhaust gases passing through said exhaust passage and producing an output signal having cycles of output variation, an electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied to the intake passage by an air-fuel mixture supply means, a feedback control means comprising a judging circuit means for judging the output signal of said detector means and a driving circuit for producing a driving output for driving said electromagnetic valve in dependency on an output signal of said judging circuit means for controlling the air-fuel ratio by feedback control to a value approximately to a stoichiometric air-fuel ratio, the improvement comprising

a maximum value hold circuit means for holding a maximum value of the output signal of said detector means in one cycle of the output variation of the detector means,

a minimum value hold circuit means for holding a minimum value of the output signal of said detector means in said one cycle of output variation of said detector means,

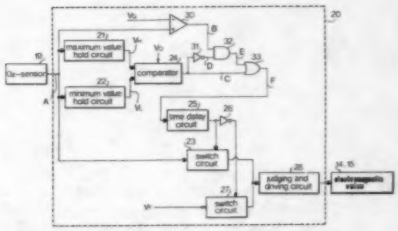
a first comparator means for comparing outputs of said both hold circuit means and for producing an output signal which is low when the difference of said maximum value from said minimum value is lower than a predetermined value,

a second comparator means for comparing the output signal of said detector means with a predetermined reference level and for producing an output signal

gate circuit means responsive to said output signals of said first and second comparator means for producing gate control signals,

a fixed voltage supply source,

switch circuits responsive to said gate control signals and



connected to said detector means and said fixed voltage supply source, respectively, and to said judging circuit means,

said gate circuit means for operating said switch circuits such that

when the output signal of said detector means is at least as high as said predetermined reference level regardless of the level of the output signal of said first comparator means, or,

the output of said detector means is lower than said predetermined reference level and the output of said first comparator means is high, said switch circuits connect the output signal of said detector means to said judging circuit means for performing the feedback control,

but when the output signal of said first comparator means is low and the output of said detector means is lower than said predetermined reference level, said switch circuits connect said fixed voltage supply source to said judging circuit means.

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FUEL CONTROL SYSTEM

Kenneth J. Stuckas, Mobile, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 88,767, Oct. 29, 1979, Pat. No. 4,305,364. This application Nov. 16, 1981, Ser. No. 321,911
Int. Cl.³ F02M *7/00*; F02B *3/00*
U.S. Cl. 123—440 **6 Claims**

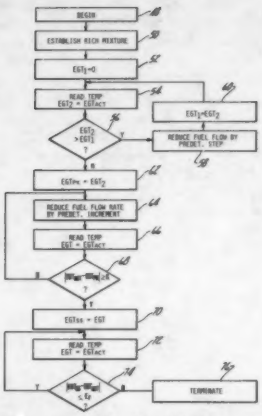
1. A fuel control system for an internal combustion engine comprising:

means for repeatedly sensing the temperature of the exhaust gases from said engine, wherein the temperature of the exhaust gases decreases from a peak value as the fuel mixture to the engine is either enriched or leaned;

means for insuring that the fuel-air ratio is initially richer than the fuel-air ratio corresponding to the peak exhaust gas temperature;

means for thereafter determining the peak exhaust gas temperature by repeatedly decreasing the fuel flow rate to the

engine by predetermined fuel flow increments until the exhaust gas temperature is less than the previously determined exhaust gas temperature so that the fuel-air ratio is less than that corresponding to the peak exhaust gas temperature; and



means for thereafter decreasing the fuel flow rate to the engine in predetermined increments until the exhaust gas temperature attains a steady state temperature, said steady state temperature being equal to a predetermined temperature offset from the peak exhaust gas temperature, and for thereafter maintaining a constant fuel flow rate to the engine.

4,408,586

FUEL INJECTION PUMP

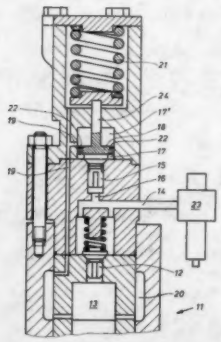
Cornelis van Rinsum, Kressbronn, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Friedrichshaften GmbH, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,188

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023731

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—446 **11 Claims**



1. A fuel injection pump for a diesel engine, the pump comprising means for supplying a flow of fuel to a fuel injection nozzle means, and a first delivery valve means arranged in the supply means for controlling a flow of fuel therethrough, a fuel holding chamber means is arranged on a downstream side of the delivery valve means, means are provided for communicating the holding chamber means with the supplying means, a further delivery valve means is provided for controlling a flow of fuel through the communicating means, means are displaceably mounted in the holding chamber means for separating the holding chamber means into two volumes, and in that means are provided for communicating the holding chamber means with a relief chamber means,

the separating means is a movable wall member, the means for communicating the holding chamber means with the supplying means is a fuel duct branching off the supplying means on a downstream side of the first delivery valve means, and in that the means for communicating the holding chamber means with the relief chamber means is an overflow duct, characterized in that

the further delivery valve means includes a valve insert,

spring means are provided for normally urging the wall member in a direction toward the valve insert, the wall member being mounted so as to be movable with the valve insert.

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FUEL INJECTION SYSTEM

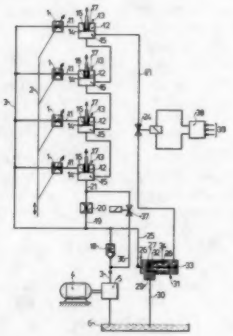
Michael Wissmann, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,384

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006258

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—454 **1 Claim**



1. A fuel injection system for mixture-compressing internal combustion engines with external-supplied ignition having metering valves disposed in a fuel supply line for metering a quantity of fuel which is in a specific ratio to the quantity of air aspirated by the engine, wherein the metering is effected at a pressure difference determined by a regulating valve, said regulating valve having a movable valve element disposed downstream of each of said metering valves and arranged to regulate said pressure difference at each of said metering valves, said movable valve element further arranged to be subjected on the one hand to the fuel pressure downstream of the respective metering valve and a spring and on the other hand to the pressure in a control pressure line, a pressure regulating valve arranged to communicate with said fuel supply line between said metering valve and a pressure-reduction valve said last named valve disposed in said fuel supply line upstream of said metering valves, said control pressure line communicates with said fuel supply line via at least one control throttle, and at least one electromagnetic valve is provided to influence the pressure in said control pressure line so that at least a portion of said regulating valve closes, and wherein said control pressure line communicates via said control throttle with said fuel supply line downstream of said pressure-reduction valve, further that said regulating valves have control

chambers, and wherein said at least one electromagnetic valve comprises a control pressure valve electromagnetically triggerable in accordance with operating characteristics of said engine disposed downstream of said control throttle, and an electromagnetic valve is located in a bypass line around said control throttle and said pressure-reduction valve, said last named valve arranged to open in the presence of specific control signals, in particular those characterizing engine overrunning.

4,408,588

APPARATUS FOR SUPPLEMENTARY FUEL METERING IN AN INTERNAL COMBUSTION ENGINE

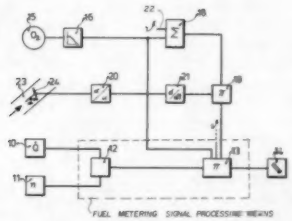
Eberhard Mausner, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 117,691, Feb. 1, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 359,955

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903799

Int. Cl.³ F02B 3/00

U.S. Cl. 123—489 **1 Claim**



1. An apparatus for fuel metering in an internal combustion engine, comprising:

an air mass flow transducer (**10**) for producing an output,

a rotational speed transducer (**11**) for producing an output,

an oxygen sensor (**15**) for air-fuel closed loop control for producing an output,

a fuel metering signal processing means (**12, 13**) connected to said respective outputs for delivering fuel metering signals, in dependence at least upon the actual air-fuel ratio,

means (**19**) responsive to an acceleration detection means (**20, 21**) connected to said signal processing means for prolonging said signals continuously during acceleration,

said means for prolonging said signal includes a multiplier stage means connected to said fuel metering signal processing means for providing an adaptation signal formed as an output signal of said multiplier stage means in accordance with the formula:

$$UA = k \cdot d\alpha/dt \cdot \partial(d\alpha/dt) \cdot [f(O_2) + f(\theta) + \dots]$$

α = engine operating parameter; k = constant; and σ (×) = sigma function.

4,408,589

PROCESS AND APPARATUS FOR OPERATING AN INTERNAL COMBUSTION ENGINE

Peter Hauler, Karlsruhe; Frieder Heintz, Blankenloch, and Erich Zabler, Karlsruhe, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 590,704, Jun. 26, 1975, abandoned. This application Jul. 14, 1977, Ser. No. 815,868

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1974, 2441826

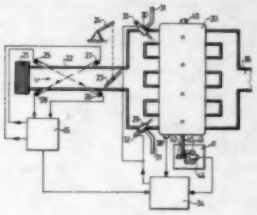
Int. Cl.³ F02B 3/00

U.S. Cl. 123—494 **4 Claims**

1. In an apparatus for operating an internal combustion engine, said apparatus including an induction tube, an electronic fuel injection system and an air flow rate metering device, said system metering out a definite quantity of fuel into the induction tube to correspond to a definite quantity of air, the improvement in the apparatus comprising:

(A) two ultrasonic transmitter means, associated with the induction tube and capable of generating ultrasonic signals and of transmitting these into the interior space of the induction tube;

(B) two ultrasonic receiver means associated with the induction tube located opposite to respective ones of the ultrasonic transmitter means and such that a line connecting each of the transmitter means with its oppositely disposed receiver means is oblique to the longitudinal axis of the induction tube, each said receiver means being capable of receiving the ultrasonic signals transmitted by its oppositely disposed ultrasonic transmitter means after passage



of the signals through at least a portion of the interior of said induction tube; and

(C) means for measuring the travel time of the ultrasonic signals between said transmitter means and said receiver means, said measuring means including:

(i) oscillator means, connected to each ultrasonic transmitter means, with the operating frequency of said oscillator means being such that each of said transmitter means produces thereby a continuous resonant ultrasonic output signal; and

(ii) phase comparator means, connected to the ultrasonic receiver means for receiving and continuously comparing the phase difference between the continuous resonant ultrasonic output signals, and generating an output signal which is a measure of the compared phase difference.

4,408,590

FUEL INJECTION PUMP

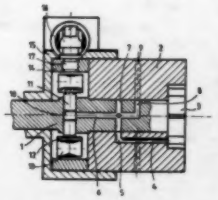
Jean-Claude Bonin, Blois, France, assignor to CAV Rotodiesel, Blois, France

Filed Feb. 20, 1980, Ser. No. 122,835

Claims priority, application France, Feb. 28, 1979, 79 05146

Int. Cl.³ F02D 1/16

U.S. Cl. 123—502 **6 Claims**



1. In a fuel injection pump for an internal combustion engine of the type comprising a body, a rotary distributor mounted in the body, driven in timed relationship with the associated

engine, at least one pumping member carried by the rotary distributor, an angularly movable ring surrounding the rotary distributor, means provided on the ring to move the pumping member thereby to effect injection of fuel as the rotary distributor rotates, the piston means coupled to the ring and slidably mounted with respect to the body, said piston means being subjected on a first end face to a fluid pressure acting between said first end face and a first part of the body and varying with the speed of the engine, and on a second end face opposed to said first end face to spring means bearing on a second part of the body and acting to oppose the movement of said piston means under the action of said fluid pressure, the improvement comprising:

a rod slidably mounted in said second part of the body, a cup-shaped member facing said second end face of the piston means and slidably mounted on said rod, said spring means urging said member towards said second end face, whereby said cup-shaped member comes into contact with said second end face when said piston means is urged by the fluid pressure towards said second part of the body, and an actuating member for defining the axial position of said rod.

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INJECTION TIMING CONTROL DEVICE FOR DISTRIBUTOR-TYPE FUEL INJECTION PUMPS

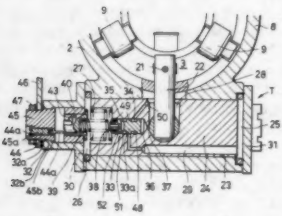
Hisashi Nakamura, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,787

Claims priority, application Japan, Nov. 15, 1980, 55-161189

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—502 **3 Claims**



1. An injection timing control device for combination with a fuel injection pump of the type including a pumping and distributing plunger, and a roller holder carrying a plurality of rollers circumferentially arranged and disposed in camming engagement with an end face of said plunger, said injection timing control device comprising:

a cylinder;

a timer piston slidably received within said cylinder, said timer piston being coupled to said roller holder such that displacement thereof causes a corresponding change in the circumferential position of said roller holder;

a first chamber defined at one end of said timer piston;

a second chamber defined at another opposite end of said timer piston, said second chamber communicating with a zone under lower pressure;

a timer spring accommodated within said second chamber and axially urging said timer piston;

a passageway formed in said timer piston for supplying said first chamber with fuel pressure variable as a function of the rotational speed of an internal combustion engine associated with said fuel injection pump; and

servo valve means arranged within said timer piston and across said passageway, said servo valve means being actuatable in response to said fuel pressure variable as a function of the rotational speed of said engine;

said servo valve means being automatically displaceable relative to said timer piston in response to a change in said fuel pressure, to open said passageway at a first predetermined position thereof to allow feeding of said fuel pressure to said first chamber for displacement of said timer piston in an injection timing advancing direction, to open said passageway at a second predetermined position thereof to allow escape of fuel pressure in said first chamber to said zone under lower pressure for displacement of said timer piston in an injection timing retarding direction, and to close said passageway at a third predetermined position thereof to hold said timer piston stationary;

said servo valve means comprising:

a valve bore axially formed in said timer piston;

a valve body slidably fitted in said valve bore, said valve bore having end faces, an outer peripheral surface formed with a land and first and second annular grooves arranged in axial juxtaposition, said valve body being arranged to be urged at one of said end faces thereof by said fuel pressure variable as a function of the engine rotational speed, said first annular groove being disposed to communicate with a suction chamber of said fuel injection pump to be supplied with fuel pressure variable as a function of the engine rotational speed, said second annular groove communicating with said second chamber;

a servo spring disposed to urge another of said end faces of said valve body against said fuel pressure variable as a function of the engine rotational speed;

a spring seat on which said servo spring is seated, said spring seat having an axis and a spirally extending end face remote from said servo spring; and

an adjusting member arranged rotatably and eccentrically with respect to the axis of said spring seat and having an end disposed in urging contact with said spiral end face of said spring seat;

whereby said adjusting member, when rotated about said axis of said spring seat, causes a change in the axial position of said spring seat to thereby vary the setting load of said servo spring;

said valve body being disposed such that said passageway encounters said first annular groove at said first predetermined position of said servo valve means, said second annular groove at said second predetermined position of said servo valve means, and said land at said third predetermined position of said servo valve means, respectively.

4,408,592

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Toru Yoshinaga, Okazaki; Toshihiko Igashira, Toyokawa; Kouichi Mori, Okazaki; Hisasi Kawai, Toyohashi, and Seiji Morino, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 18, 1981, Ser. No. 264,693

Claims priority, application Japan, May 29, 1980, 55/72276; Nov. 17, 1980, 55/162229; Nov. 26, 1980, 55/166180

Int. Cl.³ F02P *9/00*

U.S. Cl. 123—625 **8 Claims**

1. An ignition system for an internal combustion engine comprising:

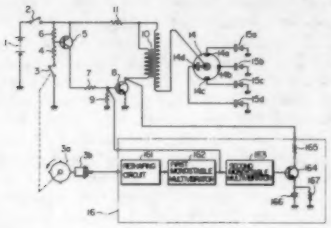
an ignition coil having a primary and secondary winding generating a spark voltage when said primary winding is deenergized,

first signal generating means for generating a first signal having two output levels,

switching means for permitting energization and deenergization of said primary winding in response to one and the other of said two output levels of said first signal respectively,

second signal generating means for generating a second signal when an engine output shaft arrives at a predetermined angular position close to the top dead center position of said output shaft; and

control means, including discriminating means for determining whether an ignition advance angle period starting with the deenergization of said primary coil and ending at the timing of compression top dead center is shorter than a duration period of the high-voltage induced spark discharge, for causing reenergization of the primary winding to interrupt the generated spark discharge in response to said second signal and the other of said two output levels only when said discriminating means determines that said ignition advance angle period is shorter than said duration period.

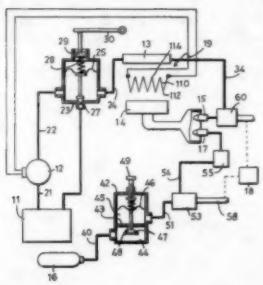


4,408,593

LIQUID FUEL COMBUSTION APPARATUS

Michitake Furumoto, and Shinichi Harada, both of Tokyo, Japan, assignors to Nippon Carbureter Co., Ltd., Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,673
Int. Cl.³ F24C *5/00*; F23D *11/44*
U.S. Cl. 126—85 R **7 Claims**



1. A liquid fuel combustion apparatus comprising a housing, a liquid fuel tank to be disposed in said housing, a vaporizer for evaporating the liquid fuel supplied thereto from said fuel tank, a liquid fuel pump for supplying the liquid fuel from said fuel tank, a burner for burning the vaporized liquid fuel in passing through said vaporizer, a first nozzle for injecting the vaporized liquid fuel into said burner, a fuel conduit communicating said vaporizer with said first nozzle, a first valve means provided in said conduit, a fuel gas supply source, a second nozzle for injecting the fuel gas of said fuel gas supply source, a fuel gas conduit communicating said fuel gas supply source with said second nozzle, a second valve means provided in said fuel gas conduit, means for changing the operation of said first valve means and the operation of said second valve means, and a thermo-electric generator for producing electric energy for operating said fuel pump when said vaporizer has been heated by the fuel gas to a desired temperature.

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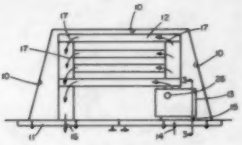
FIREPLACE HEATED GRATE

Ronald J. Shimek, Rte. 3 Lakeview Dr., Prior Lake, Minn. 55372, and Daniel C. Shimek, 2050 Fairmount Ave., St. Paul, Minn. 55105

Filed May 4, 1981, Ser. No. 260,351
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **12 Claims**



1. A plenum for cooling an electric motor in a fireplace enclosure environment, comprising:

a box shaped plenum adapted to be placed in a heated fireplace,

an electric motor mounted in said plenum,

a blower connected to said electric motor in said plenum,

an inlet to said blower inside said plenum,

an outlet port in said plenum,

an outlet from said blower connected to said outlet port in said plenum,

a cool air inlet port in said plenum,

a diversionary air vent in said plenum located at an elevation above said cool air inlet port,

said diversionary vent comprising a normally open movable closure,

said movable closure adapted to be opened when said electric motor and said blower are not circulating cool air through said plenum, and

means for closing said movable closure when said electric motor and said blower are circulating cool air through said plenum, whereby cool air is circulated from said cool air inlet port through said diversionary air vent when said plenum is hot, thus creating convection cooling of said electric motor when said electric motor is not running.

4,408,595

TURRET MOUNTED SOLAR CONCENTRATOR WITH BOOM MOUNTED SECONDARY MIRROR OR COLLECTOR

Howard F. Broyles, 4283 Aralia Rd., Altadena, Calif. 91001; Mark L. White, 2535 Whittier Dr., La Cresenta, Calif. 91214, and Neil F. Dipprey, 20920 Anza Ave. #353, Torrance, Calif. 90503

Filed Sep. 5, 1978, Ser. No. 939,346
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—424 **18 Claims**

18. A solar energy concentrator and collector assembly comprising,

a base having a vertical axis;

a turret mounted on said base for rotation about said vertical axis;

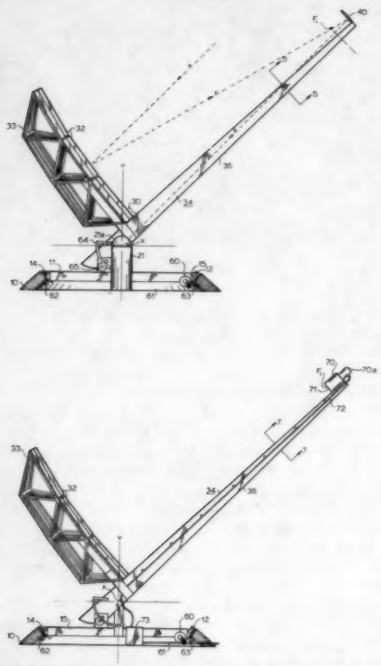
a concentrator/collector assembly amounted on said turret for rotation about a second axis intersecting said second axis;

the primary concentrator of said concentrator/collector assembly constituting a concentrating mirror formed in substantially a hemi-parabolic section configuration;

the collector of said concentrator collector assembly including an elongated boom extending normal to said second axis and a solar energy collector positioned or said boom substantially at the focus region of said concentrator;

said concentrator extending substantially entirely above the

plane defined by said boom and said second axis; and means for receiving energy from said concentrator/collector located within said turret in the region of the intersection of said axes.

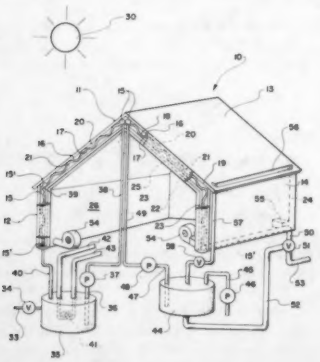


4,408,596

HEAT EXCHANGE SYSTEM

Douglas L. Worf, 109 Perth Ct., Cary, N.C. 27511

Filed Sep. 25, 1980, Ser. No. 190,665
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—428 **10 Claims**



1. An improved solar energy heating and cooling system comprising: a structure having a solar exposure and a nonsolar exposure; first heat exchange means mounted on said solar exposure of said structure for collecting solar energy and transferring the collected solar energy in the form of heat into said structure for heating the same, said first heat exchange means including solar energy collecting and transferring means provided with two adjacent but separate and distinct fluid flow paths with each fluid flow path being adapted to receive and channel a particular fluid medium therethrough; said first heat exchange means further including means for directing a first fluid medium through one fluid flow path of said solar energy collecting and transferring means and a second fluid medium through the other fluid flow path of said solar energy collecting and transferring means, and wherein said fluid flow paths of said solar energy collecting and transferring means are disposed such that energy in the form of heat can be readily transferred from one passing fluid medium to the other passing fluid medium; second heat exchange means mounted on said nonsolar exposure of said structure for cooling said structure and including an energy collecting and transfer means provided with two adjacent but separate and distinct fluid flow paths; said second heat exchange means further including means for directing a first fluid medium through one fluid flow path of said energy collecting and transfer means and a second fluid medium through the other fluid flow path of said energy collecting and transfer means, and wherein said fluid flow paths of said energy collecting and transfer means are disposed adjacent each other in side-by-side relationship such that energy in the form of heat can be readily transferred from one passing fluid medium to the other passing fluid medium such that energy in the form of heat may be selectively extracted from said structure so as to cool the same, whereby said first solar exposure heat exchange means can be used to both collect solar energy and use the same to heat the interior of said structure while said second nonsolar exposure heat exchange means can be utilized to effectively cool the structure.

4,408,597

PROSTHETIC OCCLUSIVE DEVICE FOR AN INTERNAL PASSAGEWAY

John B. Tenney, Jr., Williamson, N.Y., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 23, 1982, Ser. No. 371,352
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **6 Claims**

1. An occlusive cuff device for surgical implantation in the human body for the purpose of opening and closing an internal passageway in a tubular organ and the like comprising:

cuff means including a first and second isolated cuff pressure chamber;

said first cuff chamber being regulated and pressurizable for effectively occluding said passageway of said tubular organ;

said second cuff chamber being unregulated during normal operation of said device;

each said cuff chamber including a faying surface in which said passageway is receivably fitted;

a deformation resistant cuff collar encircling said two cuff chambers; and

a fluid containing septum means in fluid communication with said second cuff chamber adapted for subcutaneous placement so that the fluid volume of said septum means and hence said second chamber may be adjusted accordingly by means penetrating the skin to accommodate use on organs of different diameter sizes and to compensate for changing organ conditions without re-operation.

4,408,598

ENDOSCOPE WITH AN AIR-LIQUID SUCTION DEVICE

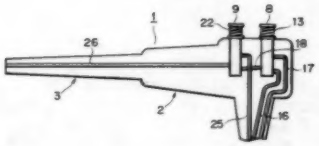
Yasuhiro Ueda, Kokubunji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,655

Claims priority, application Japan, Dec. 26, 1980, 55/185941

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **8 Claims**



1. An endoscope comprising:

an insertion section including a proximal end and a distal end portion;

a control section connected with the proximal end of said insertion section;

an air-liquid selector valve and a suction control valve attached to said control section;

a common tube extending through said insertion section, having one end connected with said suction control valve and the other end opened at the distal end portion of said insertion section; and

connecting means for connecting said suction control valve and said air-liquid selector valve,

said air-liquid selector valve having a feed-air port, a feed-liquid port, and selector means for selectively connecting said ports with said connecting means, and

said suction control valve having a suction port and selector means for selectively connecting said suction port and said connecting means with said common tube.

4,408,599

APPARATUS FOR PNEUMATICALLY CONTROLLING A DYNAMIC PRESSURE WAVE DEVICE

Thomas A. Mummert, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed Aug. 3, 1981, Ser. No. 289,489

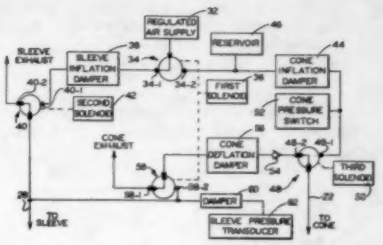
Int. Cl.³ A61H *1/00*

U.S. Cl. 128—24 R **14 Claims**

12. In an apparatus intended for use in applying compressive pressure to a mammal extremity including a first inflatable chamber surrounding the extremity, a second inflatable chamber enclosing the first chamber, and a pneumatic control means pneumatically connected to the first and second chambers for inflating and deflating the chambers from a source of pressurized gas such that the chambers apply compressive pressure to the extremity, a pneumatic control means comprising:

means for inflating a first chamber;

means for sealing the first chamber and for inflating a second chamber when the pressure within the first chamber reaches a first predetermined level; and



means for deflating the first chamber while continuing to inflate the second chamber when the pressure within the second chamber reaches a second predetermined level.

4,408,600

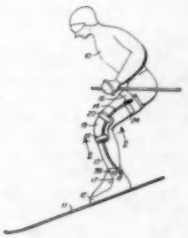
LEG AID DEVICE AND METHOD

Edward P. Davis, 1446 Delaware Ave., West St. Paul, Minn. 55118

Continuation-in-part of Ser. No. 146,142, May 2, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,363

Int. Cl.³ A61F *3/00*; A41D *13/00*

U.S. Cl. 128—80 R **28 Claims**



1. A leg aid device comprising elongated means for placement upon a user's leg and holding means for maintaining said elongated means upon the user's leg, wherein:

(a) said elongated means consists essentially of elongated flexibly resilient biasing means having a length sufficient for placement in approximate alignment with the user's leg from a level near the ankle area up to at least the level of the mid-thigh area and having a flexibility sufficient for said length to be repeatedly yieldingly bent into at least a semi-circle without taking on a permanent set, said biasing means, when held upon a body-supporting user's leg by the holding means hereinafter recited, functioning to support a portion of the user's body weight during times the user's leg is in flexed condition and functioning to aid the user's leg muscles in causing extension of the user's leg from a flexed condition, and

(b) said holding means consists essentially of

(i) a lower holder for fastening the lower end of said biasing means at a level near the user's ankle area,

(ii) an upper holder for maintaining the upper end of said biasing means at a level at least as high as the user's mid-thigh area, and

(iii) an intermediate holder comprising means for applying a forward pulling force transversely upon said biasing means at a mid-portion thereof at the level of the user's knee area, said intermediate holder being separate from said lower and upper holders but functioning in cooperation therewith to cause said biasing means to urge the

user's leg toward a straightened condition without significant torsion or twisting of the user's leg and also functioning in cooperation therewith during leg flexure to cause said biasing means to take on an arcurate contour throughout substantially the entire length of said biasing means.

4,408,601

BONE COMPRESSION PLATE

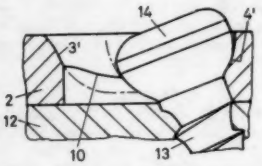
Rolf A. Wenk, Balsthal, Switzerland, assignor to Wilh. Wenk AG, Hägendorf, Switzerland

Filed Apr. 6, 1981, Ser. No. 251,872

Claims priority, application Switzerland, Apr. 14, 1980, 2870/80

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 D **2 Claims**



1. An elongated bone compression plate having a longitudinal centerline and a transverse centerline, said plate being formed with a plurality of slitlike holes each adapted to receive a countersunk bone screw having a ball head, each said slitlike hole being located in said plate substantially along the longitudinal centerline thereof and on both sides of the transverse centerline thereof with one end of said slitlike holes being distal thereto, each said slitlike hole being a compound countersink and having a portion of substantially uniform depth forming a first countersunk depression extending from said one end of said slitlike hole and having a tapered second countersunk depression extending from its other end, the depth of said second countersunk depression being greater than the depth of said first countersunk depression, a bearing surface formed in said second depression cooperating with said ball head of a said bone screw, said bearing surface being formed in the area of said other end of said slitlike hole, and said bearing surface being provided over an angular zone which is symmetrical with respect to said longitudinal centerline and extending in total over an angle of more than 180° when seen in the plane defined by said longitudinal and transverse centerlines.

4,408,602

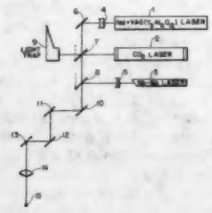
LASER KNIFE DEVICE

Tohru Nakajima, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1981, Ser. No. 224,997

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **5 Claims**



1. A laser knife device comprising first and second operating light beam sources emitting first and second laser light beams of different wave lengths respectively, a guide light source for producing a guide light beam, reflecting means for directing said first and second laser light beams from said first and second operating light beam sources and said guide light beam along a common path, a multi-articulation flexible light conducting device disposed along said common path, a focusing lens provided at an end of said multi-articulation flexible light conducting device, said reflecting means including first moveable mirror means having a first position for reflecting said guide light beam along said common path and a second position for removing said guide light beam from said common path, and second moveable mirror means having a first position for reflecting said first laser light beam along said common path when said first moveable mirror means is in said second position thereof while reflecting said second laser beam elsewhere and a second position permitting passage of said second laser light beam along said common path.

4,408,603

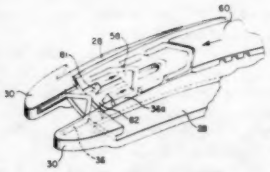
SURGICAL DEVICE

Joseph W. Blake, III, RR #2, Box 106, Kitchewan Rd., South Salem, and Jack W. Kaufman, 357 Frankel Boulevard, Merrick, both of N.Y.

Continuation of Ser. No. 200,407, Oct. 24, 1980, Pat. No. 4,372,316, which is a continuation of Ser. No. 63,268, Aug. 2, 1979, Pat. No. 4,296,751. This application Jun. 23, 1982, Ser. No. 391,367

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **2 Claims**



2. A cartridge for use with a surgical device, particularly for use with hemostatic forceps, comprising

a housing having a track provided with an outlet;

means for advancing a string of surgical clips in direction towards said outlet so that the respectively leading clips of the string are sequentially discharged from the outlet to become cinched by jaws of the surgical device; and

means for retracting the clips located upstream of the respective leading clip counter to said direction and away from said outlet prior to cinching of the discharged leading clip, so as to avoid interference by the upstream clips with such cinching, said retracting means comprising a retracting member mounted for movement between said leading clip and its adjacent clip for urging said adjacent clip and the successive clips away from said anvils;

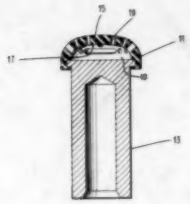
wherein each of said clips is generally U-shaped with a pair of free ends interconnected by a bight, said clips being positioned in said housing with the free ends of one clip disposed at the bight of its adjacent successive clip, and said retracting member being mounted for insertion between said bight of said leading clip and said bight of said adjacent clip, whereby movement of said retracting member away from said anvils causes said adjacent clip and said successive clips to move away from said anvils.

4,408,604

POROUS PACEMAKER ELECTRODE TIP

Michael S. Hirshorn, Double Bay; Michael Skalsky, Waverley, both of Australia; Petrus A. van Berkum, Elmhurst, Ill.; Loraine K. Holley, Rockdale, and David K. Money, Pennant Hills, both of Australia, assignors to Teletronics Pty, Limited, New South Wales, Australia

Filed Apr. 6, 1981, Ser. No. 251,708
Int. Cl.³ A61N 1/04
U.S. Cl. 128—785 12 Claims



1. An implantable porous electrode for use in a cardiac pacemaker comprising:

an electrode cap having an inner surface, an outer surface, and a plurality of uniformly spaced apertures extending from said inner surface through said electrode cap to said outer surface, and adapted for tissue ingrowth when the electrode is implanted; and

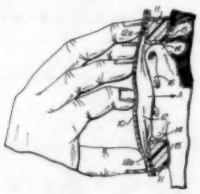
an electrode shaft joined to said cap with a cavity resulting between said inner surface of said cap and said shaft.

4,408,605

DEVICE FOR TREATMENT OF BAROTRAUMA OF THE MIDDLE EAR

John D. Doerr, 2601 E. Camino Principal, and Donn G. Duncan, 6135 E. Miramar Dr., both of Tucson, Ariz. 85715

Filed Nov. 6, 1981, Ser. No. 318,831
Int. Cl.³ A61F 7/00
U.S. Cl. 128—402 1 Claim



1. A device for treatment of barotrauma of the middle ear, said device comprising, in combination:

(a) a flexible backing portion, crushable by hand-kneading;

(b) an annular cushion portion carried by said backing portion, shaped and adapted to fit over and enclose the pinna of the outer ear and being deformable under hand pressure against said backing portion to fit the contours of the exterior portion of the head and neck around the auricle; and

(c) a hand pressure-activated chemical heating package retained by the backing and annular cushion portions and exposed to the opening of the cushion portion, said package containing chemicals separated therewithin in separate compartments and which, upon rupture of one of the compartments and subsequent mixing of said chemicals by crushing and hand-kneading, produces an exothermic reaction,

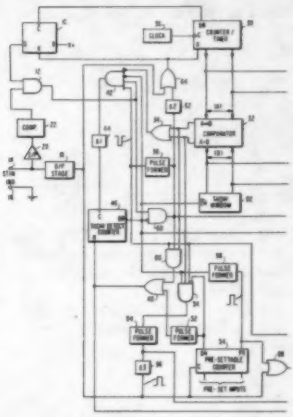
such that when said device is held in operative position over and enclosing the pinna and against the exterior portion of the head and neck around the auricle, the heat generated by said exothermic reaction is transmitted to the middle ear to treat said barotrauma by directly reducing the painful effects thereof and by increasing the volume of the air contained therewithin.

4,408,606

RATE RELATED TACHYCARDIA CONTROL PACER

Roworth A. J. Spurrell; Alan J. Camm, and David E. Ward, all of London, England, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Mar. 19, 1981, Ser. No. 245,216
Claims priority, application United Kingdom, May 19, 1980, 8016455
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 3 Claims



1. A tachycardia control pacer comprising means for confirming tachycardia, means responsive to each operation of said confirming means for generating a sequence of at least three heart stimulating pulses, means for controlling successive heart stimulating pulses in said sequence to be generated after decreasing time intervals, means for registering the last interval between heartbeats prior to the operation of said confirming means, means for controlling the first pulse in said sequence to be generated at the end of a first time interval following the last heartbeat which is equal to said registered interval less a predetermined value, the successive pulses in said sequence being generated after decreasing time intervals starting with said first time interval, means for controlling the same number of pulses to be generated during each pulse sequence, and means for preventing the pulses toward the end of any sequence from being generated after time intervals which are less than a predetermined interval.

4,408,607

CAPACITIVE ENERGY SOURCE AND CIRCUITRY FOR POWERING MEDICAL APPARATUS

Donald D. Maurer, Anoka, Minn., assignor to EMPI, Inc., Fridley, Minn.

Filed Apr. 13, 1981, Ser. No. 253,308
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 R 16 Claims

1. An electric power supply for providing electrical energy to an electrically operated medical device comprising:

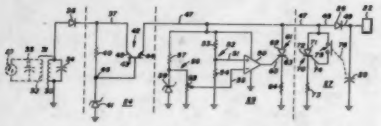
capacitor means for accommodating an electric charge;

first means providing a regulated source of unidirectional electrical energy;

second means connecting said first means to said capacitor means for supplying charging current to said capacitor

means at a first voltage which increases with charge in the capacitor means;

third means deriving from said first means a comparison second voltage of constant magnitude;



comparator means operative when said first voltage reaches a first value to reduce said first voltage to a second, lower value; and

voltage regulator means connected to said capacitor means and medical device to limit the voltage supplied to the medical device.

4,408,608

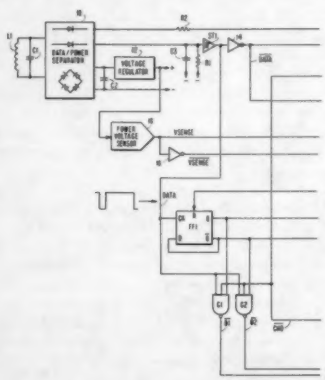
IMPLANTABLE TISSUE-STIMULATING PROSTHESIS

Christopher N. Daly, Bilgola Plateau, and David K. Money, Pennant Hills, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Apr. 9, 1981, Ser. No. 252,319

Int. Cl.³ A61N *1/30*

U.S. Cl. 128—421 **145 Claims**



1. A cochlear prosthesis comprising a plurality of electrodes, pairs of which are associated with respective stimulation sites and with at least almost all of said electrodes being included in each of at least two different pairs, means for detecting a transmitted information signal which represents both stimulation sites and stimulation intensities required therefor, and means under control of said detecting means for energizing the pair of electrodes associated with a represented stimulation site with successive opposite-polarity current pulses in accordance with the respective represented stimulation intensity, said energizing means energizing only a single pair of electrodes at any instant of time and operating fast enough such that at least any two electrode pairs can be energized successively within the time interval that allows the respective site stimulations to be perceived as occurring simultaneously.

4,408,609

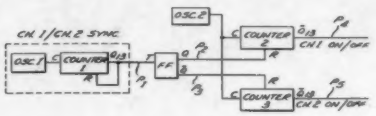
ELECTRICAL MUSCLE STIMULATION FOR TREATMENT OF SCOLIOSIS AND OTHER SPINAL DEFORMITIES

Jens Axelgaard, Downey, Calif., assignor to Professional Staff Association of the Rancho Los Amigos Hospital, Inc., Downey, Calif.

Division of Ser. No. 136,310, Apr. 1, 1980, Pat. No. 4,342,317. This application Jan. 28, 1982, Ser. No. 343,485

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—421 **4 Claims**



1. Apparatus for producing dual-channels of electrical pulse patterns for application to the patient by way of two pairs of body contacting electrodes to evoke separate fields of stimulation of predetermined muscle sites proximate the site of said pairs of electrodes, comprising:

(a) means for repetitively applying a first selected electrical pulse pattern to one pair of said electrodes sufficient to evoke contraction and relaxation of one of said muscle sites;

(b) means for applying a second selected electrical pattern to the other pair of said electrodes for contraction and relaxation of the other of said muscle sites;

(c) each of said first and second electrical pulse patterns having a varable ON period and a variable OFF period, and each of said ON periods including a RAMP-up phase, a HOLD phase and a RAMP-DOWN phase; and

(d) means for producing an adjustable synchronization pulse to trigger, in alternating fashion, the onset of said ON period of each of said first and second pulse patterns to produce, in alternate fashion, a partial overlap of said RAMP-UP and RAMP-DOWN phases of said first electrical pulse pattern with the ON period of said second electrical pulse pattern, and to produce non-simultaneous OFF periods in said first and second electrical pulse patterns, whereby each muscle site is placed, alternately, in a contraction and in a relaxation mode.

4,408,610

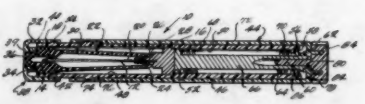
EMERGENCY ELECTRODE

Stanley J. Sarnoff, Bethesda, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed Jun. 12, 1981, Ser. No. 272,973

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—642 **7 Claims**



1. An emergency electrode comprising:

a housing assembly,

stressed spring means mounted within said housing assembly so as to be released in response to a predetermined manual actuating procedure,

an electrode needle structure mounted within said housing assembly in a sterile condition in cooperating relation with said stressed spring means for movement outwardly of said housing assembly in response to the release of said

stressed spring means so as to penetrate into the muscle tissue of a patient,

said needle structure being a hypodermic needle member provided with a hollow interior and having a bendable wire member extending outwardly from said hollow interior adjacent the leading end thereof in a trailing direction for yieldably retaining the leading end portion of said hypodermic needle member in penetrating condition within the muscle tissue of a patient,

said hypodermic needle member being encased within a resilient shroud within said housing assembly through which the leading end portion thereof extends when moved outwardly of said housing assembly, and

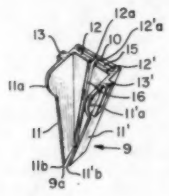
means for completing an electric circuit exteriorly through said needle structure when in said penetrating relation within the muscle tissue of a patient.

4,408,611

PROBE FOR ULTRASONIC IMAGING APPARATUS

Susumu Enjoji, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasakishi, Japan

Filed Feb. 26, 1981, Ser. No. 238,203
Claims priority, application Japan, Jul. 3, 1980, 55-89990
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **1 Claim**



1. An ultrasonic probe for receiving therethrough a puncturing cannula, said probe comprising:

a support member having at least one substantially planar surface, said member including a plurality of ultrasonic transducer elements arranged in at least one row on said one planar surface, a pyramid-shaped space formed in said member, said space having a V-shaped cross section, the apex of the V comprising a first slot between converging walls of the space and lying substantially at the center of said row of transducer elements, said space opening through a wall of the support member substantially perpendicular to said one planar surface; and

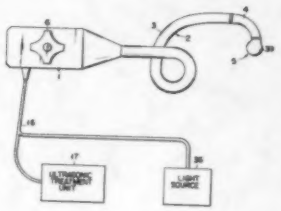
a wedge-shaped auxiliary member removably inserted into said space, said auxiliary member being substantially complementary in shape to said space and having a pair of tapering walls conforming to said converging walls, the inner apex edges of said tapering walls forming a second slot lying substantially in the plane of said planar surface and overlying the edges of the converging walls forming the first slot, the side edges of said tapering walls being free and conforming on one side to said opening of said space in said perpendicular wall and terminating on the other side in a back wall perpendicular to said tapering walls, said auxiliary member including a pair of opposing partitions extending from said tapering walls parallel to said back wall and spaced therefrom a predetermined distance, and the surfaces of said opposing partitions facing away from said tapering walls forming a uniform gap of substantially the same width as said predetermined distance, said gap opening into said second slot and said predetermined distance being slightly greater than the diameter of said cannula, the portions of said tapering walls being unobstructed between said partitions and said edges on one side for forming said free edges of said auxiliary member, and wherein said probe also includes a pair of grooves in the inner surfaces of said converging walls parallel to said perpendicular wall, and a pair of projections on the outer surfaces of said tapering walls, said projections conforming with and fitting into said grooves when said auxiliary member is installed in said support member and being positioned on the outer surfaces of said unobstructed portions of said tapering walls, and said tapering walls are formed of elastic synthetic resin and include projecting tab means on said free edges, said unobstructed portions of said elastic tapering walls being manually compressible toward each other for installation of said auxiliary member substantially horizontally into said support member, said installation including the insertion of said projections into said grooves.

4,408,612

ULTRASONIC SCANNING DEVICE FOR EXAMINING VISCERA

Mikio Utsugi, Machida, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 245,100
Claims priority, application Japan, Mar. 29, 1980, 55-40688
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **7 Claims**



1. An ultrasonic scanning device for examining viscera, comprising:

a control section having two ends;

an elongate flexible insertion section having an opening therethrough and two ends, one end being fixed to one of said two ends of said control section;

a distal end portion which is formed at the other end of said insertion section, said distal end portion having a peripheral wall, and a chamber open at said peripheral wall and being provided with front and rear end faces;

ultrasonic wave transmission-reception means provided on said front end face of said chamber;

means provided in said control section for pulsing and receiving echo signals from said ultrasonic wave transmission-reception means;

an ultrasonic wave reflector having two ends, one end of said reflector being rotatably disposed adjacent to said rear end face of said chamber, and the other end of said reflector being fitted with an inclined reflection plane facing said opening of said chamber of said distal end portion and ultrasonic wave transmission-reception means at a predetermined angle;

a motor provided in said control section for driving said ultrasonic wave reflector;

a flexible linear member which extends through said insertion section and has two ends, one end of said flexible linear member being fixed to said motor, and the other end of said flexible linear member being fixed to said one end of said ultrasonic wave reflector, said linear flexible member being so arranged as to transmit the rotation of said motor to said ultrasonic wave reflector;

a flexible guide tube extending through said insertion section and having two ends, one end of said flexible guide tube being connected to said control section and the other end of said flexible guide tube being connected to said distal

end portion, said flexible linear member extending through said flexible guide tube;

a sealing member provided only at said one end of the flexible linear member effecting a liquid-tight seal between the interior of said guide tube and said motor;

a liquid filled in said chamber and in that portion of said flexible guide tube which extends between said sealing member and said other end of said flexible linear member; and

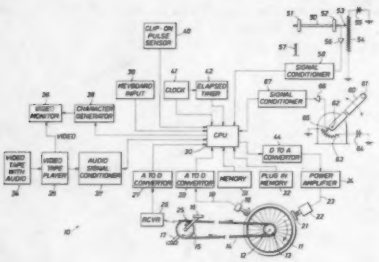
closing means coupled to said chamber to close said chamber in a liquid-tight state to retain said liquid in said chamber, said closing means being ultrasonically transparent.

4,408,613

INTERACTIVE EXERCISE DEVICE

Richard D. Relyea, Austin, Tex., assignor to Aerobitronics, Inc., Austin, Tex.

Filed Oct. 2, 1981, Ser. No. 307,738
Int. Cl.³ G01L 5/02
U.S. Cl. 128—670 **16 Claims**



1. For use with an exercise device including a movable part and moved by exercise of an user input through an input means and retarded by an adjustable brake, and further including sensor means for detecting the rate of exercising on the exercise device by a user, the apparatus comprising:

(a) means for receiving a specified exercise rate for a user;

(b) comparator means for comparing the specified exercise rate from said receiving means with the exercise rate sensed by the sensor means on the exercise device;

(c) a video monitor positioned to be viewed by the user;

(d) video player means adapted to be loaded with a storage medium having a video storage track and a separable storage track;

(e) means connecting a video signal output from said video player means to said video monitor to form a visual image for a user;

(f) signal forming means responsive to said storage medium wherein a signal is recorded on the separable storage track, said signal forming means forming signals from said storage track applied to said receiving means to set an instantaneous specified exercise rate for the user responsive to the signal of said storage track; and

(g) wherein said storage track signal varies said instantaneous specified exercise rate.

4,408,614

BLOOD PRESSURE MEASUREMENT WITH KOROTKOV SOUND ARTIFACT INFORMATION DETECTION AND REJECTION

Charles S. Weaver, Palo Alto, and Constance T. Chittenden, Los Altos, both of Calif., assignors to SRI International, Menlo Park, Calif.

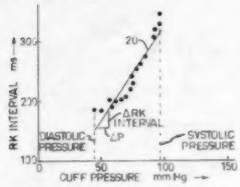
Filed Jul. 6, 1981, Ser. No. 280,798
Int. Cl.³ A61B 5/02
U.S. Cl. 128—680 **14 Claims**

1. A machine implemented method for identifying and removing artifacts in Korotkov sound signals for use in a system for measuring systolic and diastolic blood pressure, obtaining a measure of the systolic slope of blood pressure waves, or the like, comprising the steps of:

(1) recurrently obtaining cuff pressure measurements and arrival times of peak R-wave signals and Korotkov sound signals including artifacts through the active K-sound range of a cuff pressure deflation,

(2) using arrival times of associated R-wave signals and Korotkov sound signals and artifacts, determining RK intervals from which a plurality of RK interval versus cuff pressure points are obtained, some of which are true points and others of which are artifact points,

(3) processing said points to group the same such that one group includes substantially only true points, said processing comprising;



(a) from an existing point at high cuff pressure, estimating an RK interval value RK for a next lower cuff pressure which includes a point,

(b) including the point at said lower cuff pressure in a group which includes also said existing point when the difference $\Delta RK = RK - RK$ at a lower cuff pressure is within a predetermined range, and not including the point at said lower cuff pressure in the group when the difference ΔRK is outside said predetermined range,

(c) repeating steps *3a* and *3b* but using the last included point in the group for estimating an RK interval value for a next lower cuff pressure which includes a point,

(d) repeating steps *3a*, *3b* and *3c* using ungrouped points until all points are included in a group, and

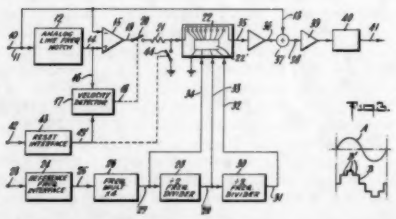
(4) selecting as the one group which includes substantially only true points that group which includes the greatest number of points.

4,408,615

INTERFERENCE FILTER

Hyman Grossman, Buchanan, N.Y., assignor to Cambridge Instruments, Inc., Ossining, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,469
Int. Cl.³ A61B 5/04
U.S. Cl. 128—696 **13 Claims**



1. An interference filter for the removal of AC interference caused by power lines from a signal containing information to be processed comprising means for filtering said interference from said signal and producing a filtered signal free of interference, means for combining the filtered signal with the unfiltered signal to produce an interference signal, means for re-

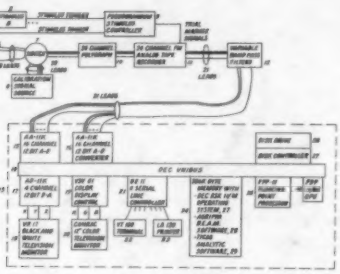
versing the phase of the interference signal relative to the interference in the first said signal and means for combining the last said interference signal with the first said signal to produce a resultant signal wherein the interference is cancelled.

4,408,616

BRAIN ELECTRICAL ACTIVITY MAPPING

Frank H. Duffy, Brookline, Mass., and Norman D. Culver, Spotswood, N.J., assignors to The Children's Medical Center Corporation, Boston, Mass.

Filed May 15, 1981, Ser. No. 264,043
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—731 **82 Claims**



1. Apparatus for generating a topographic display of information on the electrical activity of the brain, said apparatus comprising

a plurality of electrical-activity transducers adapted to be placed at spaced apart locations on the skull of a patient,

stimulus means for repeatedly providing a sensory stimulus for activating the brain to produce EP responses to said transducers,

response averaging means connected to be responsive to said transducers, to produce average responses for each transducer,

processing means connected to be responsive to said averaging means for processing said average responses to generate a time sequence of matrices,

display means connected to be responsive to said processing means, for displaying said matrices as a time sequence of topographic maps of the skull, said matrice having elements defining discrete points of said maps,

said display means including means for displaying said topographic maps at a variable frame rate, said maps corresponding to different portions of said average responses being displayed respectively at different selected frame rates.

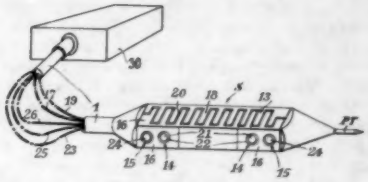
4,408,617

APPARATUS FOR DETECTING THE ACUPUNCTURE POINTS ON A PATIENT AND FOR APPLYING ELECTRICAL STIMULATING SIGNALS TO THE DETECTED POINTS

Deloffre Auguste, 13 bis, rue George Sand, 94500 Champigny S/Marne, France

Filed Jan. 19, 1981, Ser. No. 226,014
Claims priority, application France, Jan. 21, 1980, 80 01177
Int. Cl.³ A61H *39/02, 1/36*
U.S. Cl. 128—735 **9 Claims**

1. Apparatus for detecting the acupuncture points of a patient and for applying electrical stimulating signals to the detected points, comprising a main DC voltage source, a probe having a contact needle, an electrode to be held by a patient, a sawtooth signal generator connected to said main DC voltage source for producing a sawtooth signal and having an RC circuit determining the rise time of each sawtooth of said sawtooth signal, said RC circuit including a first capacitor and a resistive circuit which comprises, connected in series, a first fixed resistor and a variable resistor, said first capacitor having one terminal connected to one pole of said main DC voltage source and another terminal connected to one end of said resistive circuit, one of said contact needle and electrode being connected to another end of said resistive circuit and the other of said contact needle and electrode being connected to another pole of said main DC voltage source, a second fixed resistor, a second capacitor, DC voltage booster means connected to said sawtooth signal generator for supplying, when activated, said sawtooth signal generator with a DC voltage higher than that of said main DC voltage source, and mode-changing means for selecting between an acupuncture point



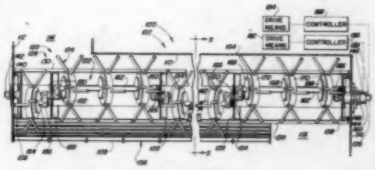
detection mode and a soft stimulation mode, said mode-changing means comprising first, second and third switch means which are associated with said second resistor, said second capacitor and said DC voltage booster means, respectively, and which, when switched in a state corresponding to said soft stimulation mode, combines said second fixed resistor with said resistive circuit so that the resultant resistance of the combined second resistor and resistive circuit is lower than the resistance of said resistive circuit, combines said second capacitor with said first capacitor so that the resultant capacitance of the combined first and second capacitors is higher than the capacitance of said first capacitor, and activates said DC voltage booster means, respectively.

4,408,618

AXIAL FLOW ROTARY SEPARATOR

Homer D. Witzel, 1700 Gulf Blvd., Englewood City, Fla. 33533

Filed Jun. 6, 1980, Ser. No. 157,141
Int. Cl.³ A01F *7/06*
U.S. Cl. 130—23 **60 Claims**



1. An axial flow rotary separator for a combine, the combine having a forward harvesting header for gathering crop material from a field and delivering it to a rearward outlet of the header, comprising:

a generally tubular separator housing including a housing wall having an inner surface and at least one foraminous portion and an upstream inlet for receiving at least a portion of the crop material gathered by the header, and a downstream outlet for discharging at least a portion of the crop material received at the inlet, some of the material passing outwards through the foraminous portion;

a rotor supported for rotation and extending within the housing for engaging crop material adjacent the inlet and propelling it to the outlet, the rotor having a frame and an axis of rotation approximately parallel to the axis of the

housing and a plurality of crop material-engaging elements carried by the frame, each element having a radially outward portion which defines a path of revolution as the rotor rotates, the inner surface of the housing wall and the path of revolution of the rotor element outward portions cooperating to define a plurality of annular clearances each having spaced apart zones of lesser and of greater radial thickness, and each crop material-engaging element being articulated with respect to the rotor frame so as to provide relative axial movement between at least the radially outward portion of the element and the housing axis as the rotor rotates; and

means for rotating the rotor and actuating the crop material-engaging elements so that at least some of the material engaged by the elements is propelled circumferentially at such a speed that it is maintained by centrifugal force in a mat generally in contact with the inner surface of the housing wall, the articulation of the crop material-engaging elements being such that when in a zone of lesser radial thickness, the axial component of the movement of each crop material-engaging element radially outward portion is substantially in a downstream direction so that each element, while engaging the mat, periodically increases and decreases its radial penetration of the mat and, while in such increased penetration, displaces at least a portion of the crop material downstream while also propelling it circumferentially and the net effect is to move the material progressively downstream towards the outlet.

4,408,619

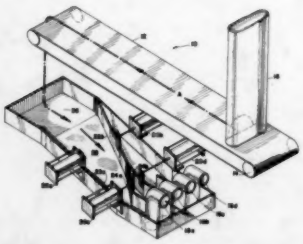
VIBRATORY PNEUMATIC TOBACCO FEEDER

J. E. Steven Perkins, Colonial Heights, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,817

Int. Cl.³ A24C *1/02*

U.S. Cl. 131—108 **5 Claims**



1. An automatic tobacco feeder for pneumatically conveying tobacco from a storage area to cigarette making machines, said feeder comprising;

a metering tube;

a conveyor belt on which tobacco from said metering tube is deposited;

a collecting pan which receives tobacco from said conveyor;

vacuum tubes located above said collecting pan for removing tobacco from said collecting pan for transport to cigarette making machines; and

control flaps for directing the flow of the tobacco to one or more of said vacuum tubes.

4,408,620

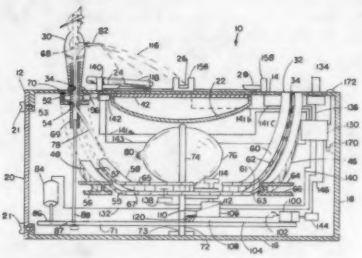
NOVELTY ITEM OF A CIGARETTE EXTINGUISHING ASHTRAY

Marvin W. Sasseen, 7145 Lindewood Pl., St. Louis, Mo. 63109

Filed Oct. 14, 1981, Ser. No. 311,412

Int. Cl.³ A24F *13/18*

U.S. Cl. 131—236 **17 Claims**



17. An ashtray comprising a receptacle having a plurality of cigarette holders spaced around the periphery thereof, a track having a portion thereof extending around at least a portion of said receptacle, said track having spaced control surfaces thereon, a figure including means supporting said figure for movement along said track, other means including a source of liquid and means connecting the source of liquid to said figure, means associated with said figure engageable with the control surfaces on said track to control the supply of liquid from said source to said figure for discharging thereby at a cigarette in the ashtray, means operatively connected to said figure for moving said figure along said track, and means connected to said moving means for generating audio and visual signals during at least a portion of the movement of said figure.

4,408,621

APPARATUS FOR TRANSFERRING CIGARETTES OR THE LIKE

Peter Schumacher, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,857

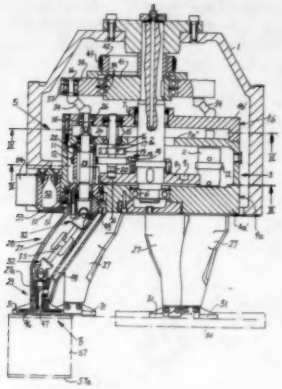
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022827

Int. Cl.³ A24C *5/32, 5/33, 5/35*

U.S. Cl. 131—282 **13 Claims**

1. Apparatus for transferring cigarettes or analogous rod-shaped articles between first and second stations at which the articles respectively advance axially and sideways at different first and second speeds, comprising a rotary carrier; a plurality of crank arms having first portions rotatably mounted on said carrier and second portions; article receiving means connected with and movable relative to the second portions of said crank arms and arranged to travel, in response to rotation of said carrier, along an endless path having spaced apart first and second portions respectively adjacent to said first and second stations; means for preventing charges in orientation of said receiving means in response to rotation of said carrier; and means for rotating said first portions of said crank arms relative to said carrier in response to rotation of said carrier, comprising stationary cam means, discrete lever means for each of said crank arms, each of said lever means being pivotable with reference to said carrier and having means for tracking said

cam means so that said lever means pivot back and forth in response to rotation of said carrier, and transmission means for



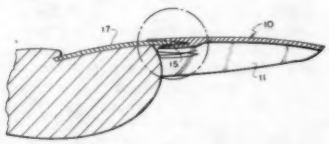
rotating said crank arms relative to said carrier in response to pivoting of the respective lever means.

4,408,622

FINGERNAIL EXTENSION

Carl H. Meyerhoefer, Huntington Station, and Carl E. Meyerhoefer, Little Neck, both of N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,123
Int. Cl.³ A45D *29/00*
U.S. Cl. 132—73 **3 Claims**



1. An artificial fingernail extension attachable to a natural fingernail comprising:

(a) A nail extension body having a forwardmost edge, and

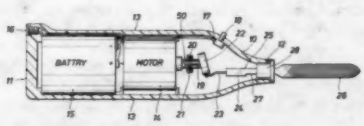
(b) a rearward concave distal upper edge and a rearward concave lower edge forming a wedge shaped arcuate pocket to receive and conform generally to the shape of the convex forward edge of the natural fingernail to position the artificial nail so that it will overlap and underlap the natural nail and be bonded thereto.

4,408,623

ELECTRICAL MANICURING DEVICE

Grant Murray, 15815 Bitridge, Houston, Tex. 77053

Filed Jun. 26, 1981, Ser. No. 277,966
Int. Cl.³ A45D *29/05;* F16H *25/08*
U.S. Cl. 132—73.6 **15 Claims**



1. A power manicuring device, comprising:

an elongate hollow housing,

an electrically powered motor means disposed in said housing,

a source of electrical energy disposed in said housing and adapted to energize said motor means,

a shaft extending from said motor means and rotatable about a shaft axis,

an offset plate interconnected with said shaft and rotatable about said shaft axis,

an attachment arm attached adjacent to the outer periphery of said offset plate and movably responsive to rotation by said offset plate,

guide means for restricting movement of at least a portion of said attachment arm to a substantially linear direction, and

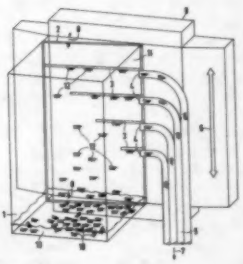
a reciprocating manicuring implement interconnected with said attachment arm and driven linearly in both directions along its longitudinal axis by said electrically powered motor means.

4,408,624

SYSTEM FOR ARRANGING FERROMAGNETIC COIL SPRINGS AND FEEDING SAME TO A WORK STATION

Horst Friemert, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,014
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047587
Int. Cl.³ B08B *3/04*
U.S. Cl. 134—133 **5 Claims**



1. An arrangement for unscrambling ferromagnetic coil springs from a random pile, the arrangement being of the type which utilizes a traveling electromagnetic field for unscrambling the coil springs and for feeding them to a work station, the arrangement comprising:

cassette means formed of non-ferromagnetic material in a rectangular configuration, said cassette means having a first interior vertical surface provided with outlet openings which are arranged vertically above one another, and at predetermined distances from one another, said cassette means further having a second interior surface having impact edges thereon, said impact edges being horizontally arranged at vertical heights corresponding to respectively associated ones of said outlet openings of said first interior surface, said impact edges being raised from said second interior surface by a predetermined impact edge height;

discharge tube means formed of a non-ferromagnetic material engaged with respectively associated ones of said outlet openings of said first interior surface; and

linear motor stator means for producing the traveling electromagnetic field, said cassette means being vertically fastened to said linear motor stator means so as to produce an acute angle between said linear motor stator means and said second interior surface of said cassette means, said

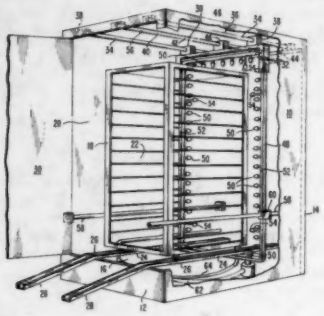
acute angle having an apex which is in the vicinity of a junction between said first and second interior surfaces.

4,408,625

ARTICLE WASHING MEANS WITH MOVABLE SPRAY HEADS

Henry Y. Kuhl, Kubl Rd., R.D. 1, Box 485A, Flemington, N.J. 08822

Filed May 7, 1982, Ser. No. 375,835
Int. Cl.[3] B08B *3/02*
U.S. Cl. 134—144 13 Claims



1. An article washing means with movable spray heads comprising:

(a) a housing means including a front wall and a rear wall and defining an entry opening in said front wall through which to move articles into said housing to be washed and rinsed, said housing further defining a washing compartment therein to contain washing and rinsing solutions being sprayed;

(b) article support means extending through said housing means and adapted to elevate an article to be washed above the floor of said washing compartment;

(c) a frame means secured to the interior of said housing means and being longitudinally movable therein from adjacent said front wall to adjacent said rear wall;

(d) at least one frame support means extending from adjacent said front wall to adjacent said rear wall, said frame support means being fixedly secured with respect to said housing means;

(e) a frame support guide means fixedly secured with respect to said frame means and movably secured with respect to said frame support means to guide said frame means in longitudinal movement along said frame support means within said washing compartment;

(f) a drive shaft rotatably mounted within said washing compartment and extending longitudinally therethrough, said drive shaft defining a spiral groove means extending therealong;

(g) a drive means secured with respect to said drive shaft to cause selective rotation thereof;

(h) a drive follower fixedly secured with respect to said frame means and movably secured with respect to said drive shaft, said drive follower extending into said spiral groove means of said drive shaft to urge said frame means to move longitudinally within said housing responsive to selective rotation of said drive shaft;

(i) a washing conduit means for carrying washing solution and being fixedly secured with respect to said frame means to be longitudinally movable therewith in said washing compartment, said washing conduit means extending peripherally around the location of an article to be washed for thorough cleansing thereof;

(j) a plurality of washing spray means each secured with respect to said washing conduit means and in fluid flow communication with respect to the washing solution thereof to deliver the solution to the article to be washed within said washing compartment;

(k) a rinsing conduit means for carrying rinsing solution and being fixedly secured with respect to said frame means to be longitudinally movable therewith in said washing compartment, said rinsing conduit means extending peripherally around a location of an article to be rinsed for thorough rinsing thereof;

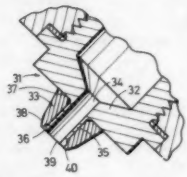
(l) a plurality of rinsing spray heads each secured with respect to said rinsing conduit means and in fluid flow communication with respect to the rinsing solution thereof to deliver the solution to the article to be rinsed.

4,408,626

VALVE SEAT ASSEMBLY FOR A STEAM TRAP

Katsuji Fujiwara, Kakogawa, Japan, assignor to TLV Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,563
Claims priority, application Japan, Oct. 8, 1980, 55-141224; Nov. 4, 1980, 55-158431[U]
Int. Cl.[3] F16T *1/30*
U.S. Cl. 137—185 7 Claims



1. A valve seat assembly for a steam trap including a housing having an interior wall defining a valve chamber, said valve seat assembly being mounted in said housing and defining a valve orifice in flow communication with said valve chamber with a buoyant float member being movably mounted within said valve chamber and adapted to be brought into and out of engagement with said valve seat assembly to close and open said orifice, said valve seat assembly comprising a body portion made of stainless steel mounted within said housing and defining a valve bore having said valve orifice defined at the inner end of said valve bore, a valve seat surface contiguous with and surrounding said valve orifice, and a float abutment member made of carbide located adjacent said valve seat surface on the outer periphery thereof, said float abutment member being located to serve as a contact point for said float member and to define a fulcrum about which said float member may pivot when moving into and out of contact with said valve seat surface.

4,408,627

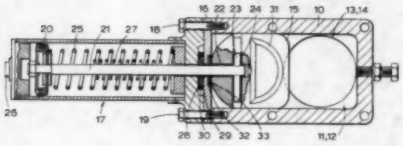
EXHAUST BRAKE VALVE UNIT

Victor A. Harris, Llanwono Rd., Ynyshir, Porth, Mid Glamorgan, Wales

Continuation-in-part of Ser. No. 575,864, May 8, 1975. This application Feb. 1, 1978, Ser. No. 874,171
Int. Cl.[3] F16K *3/02*; B08B *9/00*
U.S. Cl. 137—242 7 Claims

1. An automatic exhaust brake valve unit adapted to be connected into the exhaust system of a motor vehicle comprising a hollow body having an open end face and opposing planar walls defining a valve chamber therebetween which is open to said end face; said opposing walls each defining therein a port which in alignment with the port in the respective opposite wall defines an exhaust passage through the valve chamber; a valve closure member located within the valve chamber for sliding movement therein between said opposed planar walls and having opposed planar faces and a recess in

each of said faces to leave a land thereon for sealing engagement with a respective one of said planar walls, the valve closure member being located in the valve chamber with a clearance fit therein and being movable in a direction transverse to the common axis of said ports between a closed position whereat exhaust gas pressure on either of said planar faces of the value closure member is operable to urge it against the one of said planar walls on the opposite side of the valve closure member to effect sealing engagement of said one planar wall and planar face and thereby close the respective port in said one planar wall, and an open position in which the exhaust passage defined by said ports is substantially unobstructed; an end plate arranged to be mounted across said open end face of said hollow body to close the valve chamber, said end plate defining therein an aperture; a fluid pressure operated piston and cylinder device mounted on said hollow body with the piston rod thereof extending through said aperture defined in said plate and being coupled with the valve closure member, the valve closure member defining therein an axial bore for receiving said piston rod with clearance and a cross bore



through the axial bore, there being a pin mounted in the piston rod and extending through said cross bore with clearance whereby universal relative movement is allowed between said piston rod and said valve closure member; and securing means located externally of said cylinder device for securing said cylinder device to said open end face of said hollow body with said end plate located between said cylinder device and said open end face of said hollow body, said cylinder device, said end plate being removable from said hollow body upon releasing the securing means, whereby the cylinder device is removable from said valve body and the valve closure member is removable from said valve chamber through said open end face of said valve hollow body; and said exhaust brake valve unit further comprising scraping means disposed in a recess between said end plate and said piston and cylinder device for engagement with said piston rod, the scraping means comprising two rings having bores to closely receive the piston rod, and a coil compression spring disposed in said recess between said rings and around said piston rod to hold said rings respectively against said plate and said piston and cylinder device.

4,408,628

SYSTEM AND METHOD FOR REPAIR OF LEAKING STORAGE TANKS CONTAINING FLUIDS WHICH CONTAMINATE GROUND WATER

Robert J. Monk, Eng. Div. HQ-AAFES-EUR, APO New York, N.Y. 09245

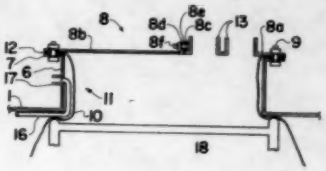
Filed Jan. 29, 1982, Ser. No. 344,207
Int. Cl.³ F16K *23/00*
U.S. Cl. 137—312 **6 Claims**

1. A system and method for repair of leaking storage tanks containing fluids which contaminate ground water comprises:

a flexible fluid tight containment means formed to the interior shape of said tank whereby fluid is stored with zero leakage inside the tank, said tank restrains said containment means from movement beyond its fully inflated size preventing overstressing;

an opening edge jointed fluid tight to said containment means and formed to the inside shape of a combination manway and appurtenances access whereby a fluid tight seal is formed with said tank when said edge is assembled as a gasket between the flange and cover of said access, said access is an integral part of said tank;

a support cage assembly inside said containment means adjacent to said access holds said containment means tight against said tank whereby strain on said opening edge is relieved when fluid storage level is low and said containment means is not fully inflated and whereby said containment means is maintained separated from said appurtenances installed inside said tank through said access;



a sampling means located between the lowest positions of said tank interior and the outside of said containment means with said sampling means being joined fluid tight with a pump which discharges into a sealed reservoir whereby leaking ground water or stored fluid can be observed and removed; and,

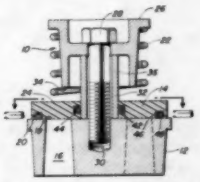
multiple corrugated spacers installed between the bottom of said containment means and bottom interior of said tank and said sampling means whereby the effective area of said sampling is increased to cover most probable tank leakage areas.

4,408,629

VALVE MODIFICATION FOR FLUID PUMP VALVES

Larry J. Lafont, Lockport, La., assignor to Conoco Inc., Ponca City, Okla.

Filed Jun. 25, 1982, Ser. No. 392,187
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—329.04 **4 Claims**



1. In a valve for controlling the flow of an abrasive fluid, said valve having a valve body with a seating surface; a fluid passage extending through said valve body to said seating surface; valve closure means comprising a planar polymeric disc having a primary planar sealing surface adapted for engagement with said seating surface and further including spring means for biasing said primary planar sealing surface of said disc into compressive engagement with said valve seating surface, said disc and spring means being mounted concentrically on a central shaft passing through a central opening having a cylindrical side wall in said disc and secured within said valve body, the improvement which comprises;

a first annular groove disposed in said primary planar sealing surface of said disc so as to engage said seating surface radially outwardly of said fluid passage, said first annular groove including a secondary sealing surface having a first resilient circular sealing member disposed therein and a second annular groove including a third sealing surface disposed in said cylindrical side wall of said opening of said disc having a second resilient circular sealing member

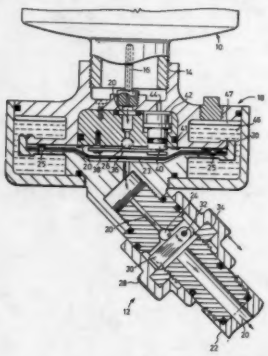
disposed therein, said second resilient circular sealing member being in compressive engagement around said shaft whereby flow of said abrasive fluid is controlled after erosion of said disc by said first and second resilient circular sealing members.

4,408,630

TORCH FOR VAPORIZABLE PRESSURIZED LIQUID

Richard J. Armstrong, 7 Jackes Ave., Suite 703, Toronto, Ontario, Canada

Filed Mar. 23, 1982, Ser. No. 361,039
Int. Cl.³ F16K *49/00*
U.S. Cl. 137—340 6 Claims



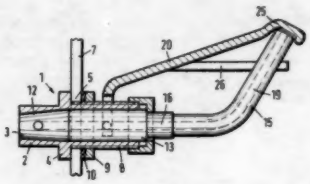
1. A valve assembly for a container of pressurized liquid fuel material that vapourizes under normal atmospheric conditions, the valve assembly being adapted to vapourize the liquid material as it flows from the bottom of a container through the valve assembly, comprising a body having an escape passage therethrough with a control valve therein operable between a closed and open position to control the escape of fuel material from the container, means forming a jacket chamber in heat exchange relation with the escape passage to contain heat storage material that is liquid under normal atmospheric conditions and that solidifies at about the vapourization temperature of the pressurized liquid fuel material to be used in the container with which the valve assembly is to be used to release latent heat of fusion, a pressure regulating expansion valve in said passage upstream of said jacket chamber, pressure regulating expansion valve control means responsive to the closed position of said control valve to close said pressure regulating expansion valve and responsive to an open position of said control valve to open said pressure regulating expansion valve and permit fuel material to flow from the container through the escape passage in heat exchange relation with the jacket chamber whereby latent heat of fusion of the heat storage material supplies the latent heat of vapourization of the fuel material as it vapourizes in the area of said expansion valve.

4,408,631

WEDGE-TYPE TAP FOR THE STERILE SAMPLING OF LIQUIDS

Klaus Uhlig, Apt. 2331 c/o Cerveceria Polar; Marian Szczurek, Calle Caurimare, Res. Los Tulipanes Apto. 52 Col.B.Monte; Carlos Vilacha, Av. Circunvalacion Del Sol, Res "46" Apto 42 Santa Paula, all of Caracas, Venezuela, and Juergen Beckmann, 7410 Reutlingen, Fed. Rep. of Germany

Filed Sep. 18, 1979, Ser. No. 77,639
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1978, 28407343
Int. Cl.³ F16K *27/08*
U.S. Cl. 137—380 2 Claims



1. A wedge-type tap for the sterile sampling of beer or wine contained in a tank, said tap comprising:

a tap housing having a cylindrical longitudinal bore with a tapered end portion defining a frusto-conical surface, said housing being sealingly mounted transversely in a wall of the tank with the apex of the tapered end of the bore lying inside the tank, said housing having an inlet opening on one side of the tapered end inside the tank;

a cylindrical faucet plug with a tapered end adapted to mate with the bore in the housing and formed with a through-passage extending in its longitudinal axis and terminating in a radial inlet portion within the tapered portion inside the tank, said faucet plug being arranged in said housing bore, being rotatable about its own longitudinal axis and having a further end portion extending from said housing;

a screw cap threaded to an outer cylindrical end portion of said faucet plug thereby securing said faucet plug to said housing in liquid-tight manner;

a bent discharge pipe fixedly connected to the outer end portion of said faucet plug,

said radial inlet portion of the faucet plug being positioned longitudinally to connect with the inlet opening of said housing and providing a flow path from the tank through the discharge pipe when said discharge pipe is in its downward position, and said tapered end of the faucet plug sealing off the inlet opening of said housing when said discharge pipe is in its upward position;

said housing and said faucet plug consisting of a material selected from the group consisting of a metal and a self-sealing slidable plastics material; and

a locking means designed as a strap pivotally mounted on said housing and having at its free end a cap for covering said discharge pipe, two legs being formed onto said strap which surroundingly engage the upwardly directed discharge pipe on either side whereby said locking means secures said discharge pipe in its upwardly directed position against inadvertent turning and covers the discharge opening of said discharge pipe.

4,408,632

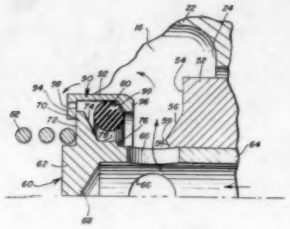
HIGH FLOW SHROUD CHECK VALVE

Preben Kent, Altadena, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 23, 1981, Ser. No. 257,224
Int. Cl.³ F16K *15/00*
U.S. Cl. 137—516.29 18 Claims

1. In a check valve having a valve body comprised of a

housing having a valve chamber, an inlet fitting extending into said valve chamber and having concentric sealing surfaces facing into said valve chamber, a poppet valve positioned in said valve chamber and being slidably mounted relative to said inlet fitting, flow ports through said poppet valve, concentric sealing surfaces on said poppet valve downstream from said flow ports, one of the sealing surfaces on said inlet fitting aligning with a sealing surface on said poppet valve, a second sealing surface on said poppet valve aligning with a second sealing surface on said inlet fitting, an annular resilient seal ring encircling said poppet valve in alignment with the second



sealing surface on said poppet valve, and means for moving said poppet valve to seal said one sealing surface on the inlet fitting and poppet against each other and to seal said seal ring between said two second sealing surfaces, in combination: shroud means encircling said seal ring and said second sealing surface on said poppet valve and movable relative to said poppet valve, means for moving said shroud means with said poppet valve as said poppet valve is moved to the open position, and means for retaining said seal ring concentrically enclosed in said shroud means as said poppet valve is opened and closed.

4,408,633

HYDRAULIC CONTROL VALVE MECHANISM

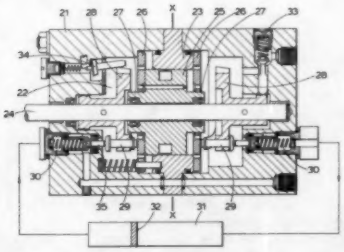
Norman J. Lee, Yapton, England, assignor to Matburn (Holdings) Limited, London, England

Filed Mar. 31, 1981, Ser. No. 249,501

Claims priority, application United Kingdom, Apr. 1, 1980, 8010927; Dec. 9, 1980, 8039450

Int. Cl.³ F15B *13/06*

U.S. Cl. 137—596.2 **5 Claims**



1. A hydraulic control valve comprising a valve body having a valve chamber therein an intermediate member dividing the valve chamber into two; a plurality of control outlets leading from the valve chamber on opposite sides of the intermediate member each of the said outlets being adapted to be connected to a device to be operated by hydraulic pressure supplied from the valve chamber; a check valve located in each one of the control outlets, each said check valve being biased to a closed position; a pair of inlet valves through which liquid can enter the valve chamber on opposite sides of the intermediate member, the said valves being biassed to a closed position; a pair of relief outlet valves leading out of the valve chamber on opposite sides of the intermediate member, and also being biassed to a closed position; a selector plunger located on each side of the intermediate member, each of the selector plungers being movable to an angular setting in which it registers with a check valve and is displaceable to open the check valve by the pressure of liquid entering the valve chamber through one of the inlet valves; and means for opening a selected inlet valve whereby liquid under pressure can enter the valve chamber to displace a selector plunger registered with a check valve so as to open that check valve and permit liquid pressure to flow from a hydraulic device to be operated.

4,408,634

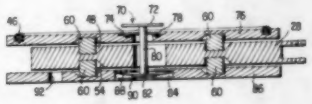
GATE STOP VALVE

Roy N. Peacock, Lafayette, Colo., assignor to HPS Corporation, Boulder, Colo.

Filed Nov. 5, 1981, Ser. No. 318,459

Int. Cl.³ F16K *3/02*

U.S. Cl. 137—630.12 **11 Claims**



1. A gate valve comprising:

(a) a casing having an inlet aperture and an outlet aperture at least one of which has a valve seat,

(b) an actuator member reciprocal in said casing transversely of said apertures and having two oppositely disposed faces.

(c) means for imparting reciprocation to said actuator member,

(d) two plate members flanking said two oppositely disposed faces of said actuator member, at least one of said plate members being a valve head for cooperation with said valve seat, and

(e) rectangular rotative means positioned between said actuator member and said two plate members for moving said two plate members from an open to a closed and latched position as said actuator member is reciprocated.

4,408,635

HYDROPNEUMATIC PULSE INTERCEPTOR

Martin R. Packer, Rocky Mount, N.C., assignor to Liquid Dynamics, Inc., Rocky Mount, N.C.

Continuation of Ser. No. 121,517, Feb. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 100,697, Dec. 5, 1979, abandoned. This application Nov. 2, 1981, Ser. No. 317,185

Int. Cl.³ F16L *55/00*

U.S. Cl. 138—30 **4 Claims**

1. A liquid flow smoother comprising in combination:

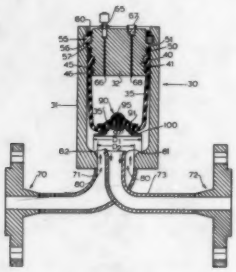
(a) a hollow cylindrical vessel having one end substantially closed and the opposite end closed by a removable circular base member extending across and closing said opposite end;

(b) gas valve means associated with said substantially closed end of said vessel and having a channel formed in said gas valve means to permit entry of a gaseous fluid within said vessel;

(c) a flexible membrane member suspended within said vessel immediately adjacent said base member and having an outer peripheral edge portion held in clamped sealing relation between said vessel and base member and establishing within said vessel and on one side of said membrane member a first fluid-type chamber communicating with said channel and valve means and holding a com-

pressible fluid admitted through said channel and valve means and held at a predetermined pressure within said chamber, said membrane member having an outer peripheral portion within said clamped peripheral edge portion which assumes a folded position when said membrane member is inoperative and flexes from such folded position when said membrane member is operative;

(d) an annular tubular inlet portion surrounding and concentric with an outlet port formed by a tube having a flared trumpet-like entrance within said vessel, said ports being formed and centrally located in said removable base member enabling a substantially incompressible fluid to flow into said vessel through the inlet portion, while within said vessel enabling said incompressible fluid to turn towards selected portions of said membrane on the side thereof opposite the said one side of said membrane establishing said chamber and thereafter without any flow restrictions between said ports exit through said outlet port, said membrane being adapted when operative to move in a first direction in a limited amount towards said gaseous fluid chamber and when inoperative being adapted to



move in an opposite second direction toward said inlet and outlet ports to an inoperative position in correspondence with the changing character of said fluid flow; and

(e) an anti-extrusion valve plate centrally located on said membrane member on the said opposite side thereof and adapted when said membrane member is moved to its inoperative position toward said inlet and outlet ports to be supported on said base member within said vessel and provide a cover over both said ports to prevent extrusion of said membrane member therethrough and to simultaneously establish an unrestricted flow path between said ports and partially bounded by said valve plate whereby the fluid entering said vessel through said inlet port is under all positions of said membrane member provided with an unrestricted flow path to flow out of said vessel through said outlet port, said valve plate being shaped so as to direct incoming liquid flow impinging thereon when said membrane is in said inoperative position and said plate is over said ports, said valve plate being further adapted to move towards and rest against said valve means and thereby limit the movement of said membrane in said first direction when said membrane is operative.

4,408,636

REHEATER ISOLATION DEVICE AND CHEMICAL CONNECTOR

Anatole N. Karpenko, San Francisco, Calif., assignor to Anchor/Darling Valve Company, San Mateo, Calif.

Filed Aug. 13, 1982, Ser. No. 407,792
Int. Cl.³ F16L *55/10, 55/16*
U.S. Cl. 138—94 **2 Claims**

1. A combination pipe coupling, clean out and isolation device comprising in combination:

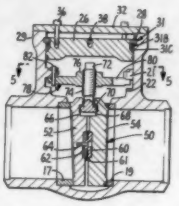
a. a "T" fitting having opposite arms adapted to couple two pipes together in end-to-end relationship,

b. a side arm extending at right angles to said arms, said side arm having a terminal end,

c. valve seats in each of said opposite arms, said seats being set at an angling relationship to each other, forming a "V" shaped opening therebetween with the open side of the "V" facing said side arm,

d. an annular, internal recess in said side arm,

e. a sealing plate forming part of said combination, said sealing plate being adapted to be placed in said side arm



and held in place by ring segments fitting into said recess and said plate,

f. a flange at the terminal end of said side arm, said flange being adapted to fasten to a clean out connector,

g. internal, inwardly extending projections within said side arm,

h. complementary split disc halves fitting into said "V" shaped opening between the valve seats,

i. a spider engaging the underside of said projections, and

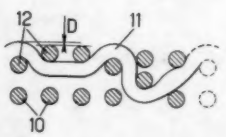
j. screw means carried on said spider, said screw means engaging said split disc halves and forcing them into sealing relationship with said valve seats.

4,408,637

DOUBLE LAYER FORMING FABRICS FOR USE IN PAPER MAKING MACHINES

Robert Karm, Selestat, France, assignor to Martel, Catala & Cie, Selestat, FranceA

Filed Sep. 29, 1980, Ser. No. 191,837
Claims priority, application France, Nov. 19, 1979, 79 28501
Int. Cl.³ D03D *15/00, 15/02;* **B21F** *1/10;* **B10D** *39/08*
U.S. Cl. 139—425 A **9 Claims**



1. Multi-layer endless forming fabric for paper-making machine and the like, comprising at least:

an upper layer of shute threads located on the material forming side of the fabric,

a lower layer of shute threads located on the wear or machine side of the fabric,

and longitudinal warp threads interwoven with the layers of shute threads, said fabric being woven with an aggregate warp ratio of at least 6 threads and an aggregate shute ratio of at least 12 strands,

wherein the binding points of the warp threads with the lower layer are distributed in a satin weave pattern, the ratio of which is equal to the aggregate warp ratio;

wherein the binding points of the warp threads with the shute threads of the upper layer are distributed according

to a pattern having a cumulated ratio equal to the aggregate warp ratio, but constituted by juxtaposed weaving patterns each with a warp ratio lower than 6; and wherein there are at least two shute threads of the upper layer between each point where a warp thread comes down through the upper layer and another point farther on where it comes up again through that same upper layer.

4,408,638

FORMING FABRIC

Jan T. Ström, Gusum, Sweden, assignor to Gusums Bruk AB, Gusum, Sweden

Filed Jan. 28, 1981, Ser. No. 229,281
Claims priority, application Sweden, Feb. 12, 1980, 8001108
Int. Cl.³ D03D *15/02*
U.S. Cl. 139—425 A **5 Claims**

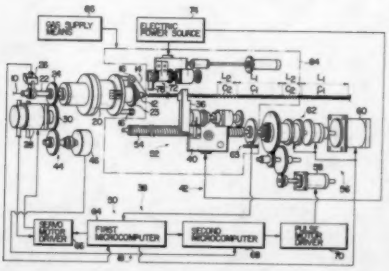
1. Endless form of fabric or screen for paper making, wherein the fabric or screen consists of one layer of first threads extending in the longitudinal direction in which the fabric is moving in the machine and one layer of second threads extending in a direction transverse to said longitudinal direction, comprising said first threads being offset from the upper plane of the screen between two longitudinally spaced points, one of said points being the position where the said first threads are passed down between two adjacent second threads, the second of said points being the position where said first threads are passed up again between another two of said second threads, each of said first threads passing over at least two of said second threads between said points, whereby cavities are formed between said two points and the area of the screen is larger than the sum of the areas of a projection of the areas of the threads onto a plane parallel with the screen.

4,408,639

COIL MANUFACTURING APPARATUS

Yoshihiro Hayama, Fujisawa, and Yuukou Hosokawa, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1980, Ser. No. 220,235
Claims priority, application Japan, Dec. 26, 1979, 54-169784; May 14, 1980, 55-63636
Int. Cl.³ B21F *3/04*
U.S. Cl. 140—71.5 **9 Claims**



1. A coil winding apparatus for manufacturing a wire coil having a leg portion at each end comprising:

a longitudinally moveable mandrel wire;

guide means operatively associated with said mandrel wire for guiding said mandrel wire during said longitudinal movement;

supply means for supplying filament wire to said mandrel wire and including means defining a filament wire feed path for feeding said filament wire to said mandrel wire between an initial position spaced from said mandrel wire to a final position downstream of said initial position, wherein said filament wire comes into contact with said mandrel wire at said final position;

coiling means operatively associated with said filament wire supply means for coiling said filament wire around said mandrel wire;

revolving means connected to said coiling means for revolving said coiling means around said mandrel wire between a coiling start time and a coiling end time;

means operatively connected to said revolving means for stopping said revolving means at said coiling end time;

leg forming means for forming said leg portion disposed between said initial and final positions of said filament wire feed path and reciprocably moveable between a starting position wherein said leg forming means is in a disengaged relationship with said filament wire and an end position wherein said leg forming means is in a filament wire engaging position to deflect said feed path and thus said filament wire towards said mandrel wire to lay said filament wire substantially parallel to said mandrel wire between said final position of said feed path and said end position of said leg forming means; and

transfer means for longitudinally moving said mandrel wire and including first and second holding means for holding said mandrel wire, and driving means operatively connected to said first and second holding means and said leg forming means for (a) moving said first holding means into a holding relationship with said mandrel wire at said coiling start time, (b) longitudinally moving said first holding means while in said holding relationship at a predetermined rate of speed away from said guide means between a first position corresponding to said coiling start time and a second position downstream of said first position corresponding to said coiling end time, (c) stopping said longitudinal movement of said first holding means at said coiling end time, while (d) simultaneously moving said second holding means into a holding relationship with said mandrel wire upstream of said first holding means when said first holding means is at said second position, the coiled filament wire thereby being disposed between said first and second holding means, (e) releasing said first holding means from its holding relationship with said mandrel wire at said second position and moving said released first holding means in a direction towards said guide means to a third mandrel wire holding position upstream of and separated from said second holding means, (f) moving said leg forming means from said starting position to said end position when said first holding means is in said third mandrel wire holding position to form said leg portion and retaining said leg forming means in said end position until said coiling start time wherein it is moved from said end position to said starting position, and (g) releasing said second holding means from said holding relationship with said mandrel wire, whereby

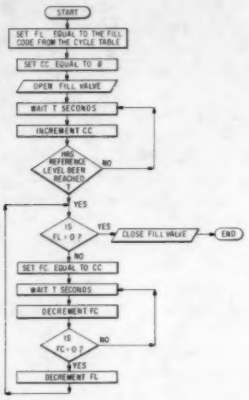
said first holding means is once again holding said mandrel wire at said coiling start time thereby permitting said transfer means to once again execute steps (a) through (g) to form a wire coil having a leg portion at each end.

4,408,640

METHOD AND APPARATUS FOR FILLING A CONTAINER

Alfonse N. Voza, Jersey City, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 26, 1981, Ser. No. 314,604
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **3 Claims**



1. A method for filling a container with a predetermined volume of liquid, there being a controllable liquid flow valve intermediate a source of the liquid and the container, the method comprising the steps of:

(a) opening the valve;

(b) providing a signal when an elemental volume of the liquid is in the container;

(c) timing the interval between the valve opening and the signal provision;

(d) providing an indication of said predetermined volume as a multiple of said elemental volume;

(e) timing a period commencing with the providing of said signal and terminating at said multiple less one times the interval determined in step (c); and

(f) closing the valve at the termination of the period timed in step (e).

4,408,641

APPARATUS FOR FILLING VISCOUS SUBSTANCES INTO HARD GELATIN CAPSULES

Taizo Yamamoto, Osaka, and Tetsuhisa Ishida, Ando, both of Japan, assignors to Nippon Elanco Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1981, Ser. No. 265,054
Claims priority, application Japan, May 22, 1980, 55-68636
Int. Cl.³ B65B *43/60*
U.S. Cl. 141—82 **9 Claims**

1. An apparatus for filling viscous substances into hard gelatin capsules, comprising:

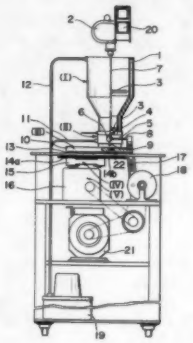
(a) a hopper member capable of storing viscous substance to be filled at a predetermined temperature and under agitation,

(b) a pumping mechanism which is communicated with the bottom portion of said hopper member and is kept at the same constant temperature as that of said hopper member, and is equipped with filling nozzle means capable of weighing and discharging the viscous substance to be filled by a predetermined amount at a predetermined cycle,

(c) a capsule body loading board which aligns and accommodates, in capsule body accommodating holes formed therein, a plurality of hard capsule bodies into which the viscous substance is to be filled,

(d) a reciprocating feed mechanism for the capsule body loading board, which transfers said capsule body loading board from a preliminary operating station to a filling station and returns said capsule body loading board back to the preliminary operating station again after completion of the filling, and

(e) an intermittent rotary mechanism for the capsule body loading board, which causes said capsule body accommodating holes formed in said capsule body loading board to correspond to the filling cycle of the pumping mechanism at said filling station thereby to sequentially align said accommodating holes with said filling nozzle means;



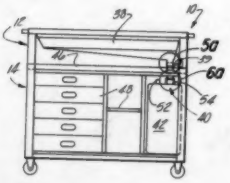
said reciprocating feed mechanism for the capsule body loading board further including an arm member associated with a pivoting mechanism therefor, and pivotally fitted, at its one end, over an output shaft of an index unit driven by a motor, and pivotally supporting, at its other end, an index table on which said capsule body loading body is detachably mounted for transferring said capsule body loading board between said preliminary operating station and said filling station.

4,408,642

PORTABLE WORKBENCH

Thomas M. Jeruzal, 6983 Lafayette, and Dennis G. Koski, 6484 Silvery La., both of Dearborn Heights, Mich. 48127

Filed Jun. 1, 1981, Ser. No. 268,689
Int. Cl.³ B27C *5/10*
U.S. Cl. 144—286 A **16 Claims**



8. A portable workbench, comprising:

a cabinet assembly comprising a lower cabinet assembly supported by a plurality of wheels and an upper removable work section,

said upper section including a work surface having perforations therein for permitting liquid to drain therethrough, and

a self-draining basin, having a drain opening and mounted under said work surface for receiving said liquid drained

through said work surface and directing said liquid to said drain opening,

said lower cabinet assembly having a removable reservoir disposed below said self-draining basin for collecting liquid drained through said drain opening and storing said liquid for subsequent disposal, said lower cabinet assembly having a second work surface having a drain assembly in communication with said reservoir, said second work surface adapted to support workpieces when said upper section is removed.

4,408,643

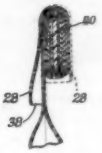
PLASTIC BAGS HAVING A PRESSURE RESISTANT CLOSURE

Louis L. Laske, Grayslake, and Donald R. Harreld, Antioch, both of Ill., assignors to Vonco Products, Inc., Lake Villa, Ill.

Filed Feb. 6, 1981, Ser. No. 232,139

Int. Cl.³ B65D *33/16, 33/24*

U.S. Cl. 383—70 **29 Claims**



1. A flexible plastic bag for holding gas, liquid, or solid contents and capable of withstanding external forces applied to the bag comprising:

first and second sheets of plastic secured together to form a bag having a body portion for said contents and an open end in an end portion, said open end comprising a stiffener strip secured to one of said sheets;

a closure member secured to the exterior of said bag forming a pocket having an opening facing away from said bag open end, said pocket opening extending across at least a portion of said bag substantially parallel to and spaced from said open end far enough so that said end portion may be folded over said stiffener strip upon itself from said open end at least two times; and

said pocket being capable of being turned inside out over said end portion folded over said stiffener strip, the end of the pocket toward said bag open end being closed when said end portion is in condition for said pocket being turned inside out.

4,408,644

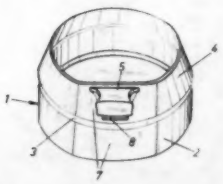
DRINKING CUP

Gustav I. Svantesson, Vargarda, Sweden, assignor to Svantesson & Andersson Mekaniska (SAMEK) AB, Vargarda, Sweden

Filed Dec. 8, 1981, Ser. No. 328,708

Int. Cl.³ A47G *19/22*

U.S. Cl. 150—55 **6 Claims**



1. An improved drinking cup manufactured from a resilient and flexible synthetic resin material and intended for repeated use, comprising a lower section, at least one upper section, said upper section being essentially in the shape of a truncated cone which cone-shaped section may be turned downwards and folded upon the lower section to reduce the volume of the cup, and a handle, said handle provided on said upper section of the cup, the improvement comprising an essentially straight portion in the upper section of the cup adjacent the handle, said straight portion imparting to the upper section a slightly oval shape serving to facilitate drinking from the cup and a rigid portion of said upper section of the cup, said handle formed at said rigid portion.

4,408,645

LAMINATED WEARING PLATE ASSEMBLY FOR TIRE CHAIN

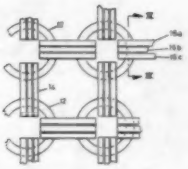
Hans O. Dohmeier, 24 Shipston La., Victoria, Johannesburg, South Africa

Filed May 24, 1982, Ser. No. 381,626

Claims priority, application South Africa, May 22, 1981, 81/3438

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—172 **6 Claims**



1. A tire protective chain to be applied to a rubber tire of an earth-moving machine and the like, comprising a closed, substantially uniform network of stiff metal wearing plates that will be substantially perpendicular to the surface of a tire in use and stiff metal connectors that are in the form of closed loops that will be substantially parallel to the surface of the tire in use and that interconnect the wearing plates by being threaded through at least one opening in each wearing plate, each wearing plate being connected to two connectors that are themselves connected to wearing plates only and each connector being connected to at least three wearing plates, the chain having a central tread portion and flanking sidewall portions, each wearing plate of the tread portion comprising a laminated assembly of at least two plate elements each of which is substantially rectangular and has at least one opening through which a connector is threaded, the opening being closer to one long edge than the other, each plate element having a thickness of between 6 and 10 mm and a hardness adjacent the surface of excess of 50 Rockwell C-scale for at least 40% of the thickness of the plate with the remaining core portion having a hardness below 50 Rockwell C-scale.

4,408,646

WHEELED VEHICLE SUPPORT APPARATUS

Robert W. Forsyth, 1267 W. 9th St., Upland, Calif. 91786

Filed Nov. 2, 1981, Ser. No. 317,559

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—179 **6 Claims**

1. A wheeled vehicle support apparatus comprising:

at least three elongated tread segments; means detachably connecting adjacent ends of said tread segments together to provide a continuous and endless circular tread;

each of said tread segments having a plurality of individual track block members hingably coupled together;

each of said track block members having ground engaging means on its exterior surface and a tire engaging means on its internal contact surface;

each of said track block members is of U-shaped cross sec-

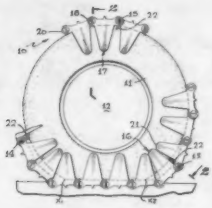
tion having a flat base with upright spaced apart guide horns; and

each of said track block members includes an internal contact surface configured with a pair of cone-shaped masses having opposing apexes terminating at the center line vertex.

6. A wheeled vehicle support apparatus comprising:

at least three elongated tread segments; means detachably connecting adjacent ends of said tread segments together to provide a continuous and endless circular tread;

each of said tread segments having a plurality of individual track block members hingably coupled together;



each of said track block members having ground engaging means on its exterior surface and a tire engaging means on its internal contact surface;

each of said track block members is of inverted T-cross section having a flat base with a single guide horn occupying the void between a dual wheel arrangement; and

each of said track block members includes an internal contact surface configured with a pair of cone-shaped masses having opposing apexes terminating at the center line vertex.

4,408,647

VEHICLE WHEEL

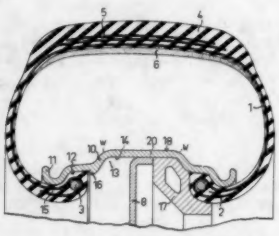
Dieter Kuhn, Burgwedel; Heinz-Dieter Rach, Garbsen; Udo Frerichs, and Henner Pieper, both of Langenhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,336

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019742

Int. Cl.³ B60B *21/10*

U.S. Cl. 152—330 RF **4 Claims**



1. A vehicle wheel having a rigid wheel rim for mounting thereon a pneumatic tire having relatively flat configuration with height/width ratio ranging from approximately 80% to 25% and having tire beads with pull-resistant cores movable over wheel flanges, said wheel rim including an outer unitary body which collectively extends substantially in the circumferential direction of said tire and comprises in combination therewith:

a middle portion of said unitary body of the rigid wheel rim which extends substantially in the circumferential direction of said tire;

respective transversely projecting flanges of said unitary body which are arranged laterally on each side of said middle portion integral therewith and extend substantially transversely thereto and radially inwardly to form a recess between said flanges on the inner periphery of said middle portion, said inner periphery of said middle portion forming the base of said recess, said recess having a width corresponding at least to the width of said respective tire beads, and serving to temporarily receive same during mounting of said tire; said transversely projecting flanges terminating laterally outwardly between

respective laterally outwardly located wheel flanges of said unitary body which extend along inner space of the tire to permit bulging of the tire laterally outwardly during emergency running operation after leakage of air therefrom free of danger of tire destruction therewith;

respective seating surfaces of said unitary body, for said respective tire beads, located between said transversely projecting flanges of said middle portion and said laterally outwardly located wheel flanges, said seating surfaces being located on the inner periphery of said outer unitary body and adjacent to said recess, said laterally outwardly located wheel flanges extending radially of said seating surfaces, said laterally outwardly located wheel flanges securing said tire beads from sliding laterally from said seating surfaces, said base of said recess having a larger diameter than do said seating surfaces of said unitary body; and

respective mantle surfaces on the outer periphery of said outer unitary body between said transversely projecting flanges and said middle portion adjacent to said recess, said mantle surfaces forming essentially planar supporting surfaces for the zenith portion of said tire during emergency operation thereof, that part of the outer periphery of said middle portion between said mantle surfaces also being, at least partially, embodied as an overall supporting surface considerably increased in axial width for said zenith portion of said tire during emergency operation of said tire, said supporting surface of said middle portion being located essentially at the level of said mantle surfaces collectively as a single, integral rim in one piece.

4,408,648

TUBELESS RADIAL PLY TIRE FOR HEAVY-DUTY VEHICLES

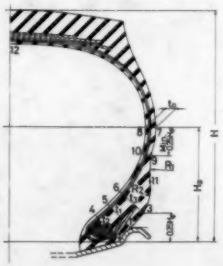
Junichi Ohashi, Mishinomiya, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed May 6, 1982, Ser. No. 375,643

Claims priority, application Japan, May 17, 1981, 56-74707

Int. Cl.³ B60C *15/00, 13/00, 9/00*

U.S. Cl. 152—353 C **1 Claim**



1. A tubeless radial ply tire for heavy-duty vehicles to be mounted on a frusto-conical seat rim comprising a carcass

composed of at least two cord plies of orgaic fiber and a belt of at least two plies of metallic cords, wherein when said tire is mounted on a standard rim and inflated to a design inner pressure, a height H_o at the maximum section width point (7) of the tire from the rim seat is in the range of 40 to 60% of the section height H at the outside diameter point of the tire; assuming that the thickness of a normal drawn from the maximum section width point to the tire inside point (8) is t_o, dimensions at the bead portion are determined so that a thickness t_1 of a normal from the bead outside point (1) at the rim flange height to the tire inside point (5) is 2.5 or more times the thickness t_o, a thickness t_2 of a normal from the rim base diameter point (2) at the inner end of the flange to the tire inside point (4) is 100 to 110% of the thickness t_1, and a thickness t_3 of a normal from the 0.25 H_o point (3) spaced apart 0.25 H_o from the rim base diameter point (2) on the maximum section width side to the tire inside point (6) is 90 to 100% of the thickness t_1; a thin sidewall region (7–9) having substantially the same thickness as t_o extends from the maximum section width point (7) toward the bead portion in a dimension of at least 0.25 H_o in height up to the min. 0.25 H_o point (9), said region being defined by a radius of curvature centered on the inside of the tire (a positive curve); and a transitional region (9-11-3) extending from the minimum 0.25 H_o point (9) in the sidewall portion to the bead portion has progressively increasing thicknesses, and is shaped so that when the tire is in as-molded state in a vulcanization mold or in a free state after releasing from the mold, its sectional contour defines a smooth line into which two curves or arcs having a radius of curvature R_1 centered on the outside of the tire (a negative curve) and a radius of curvature R_2 centered on the inside (a positive curve) blend whereas when the tire is mounted on the standard rim and inflated to the inner pressure, its sectional contour defines a positive curve or a straight line.

4,408,649

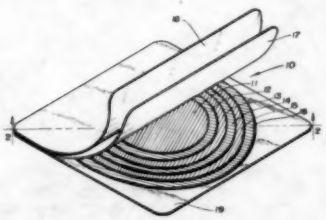
TIRE REPAIR UNIT

Donald E. Litterini, Johnstown, Ohio, assignor to Technical Rubber Company, Inc., Johnstown, Ohio

Continuation of Ser. No. 166,024, Jul. 7, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,404

Int. Cl.³ B60C *21/00*

U.S. Cl. 152—367 **11 Claims**



1. A tire repair unit comprising a plurality of sheet-form, rubberized cord plies assembled in superposed, stacked relationship with opposed surfaces of adjacent plies secured in contacting engagement with each ply having a plurality of cords that are all disposed in parallel relationship to each other and are formed in a planar layer extending substantially across said ply and adjacent plies arranged with the cords thereof oriented in predetermined relationship to each other, each of said plies being of a configuration wherein the cords thereof disposed laterally outward with respect to a central longitudinal axis are of progressively shorter length in proportional relationship to increasing displacement from the longitudinal axis, a first one of said plies being of predetermined size in surface area with each succeeding ply disposed in stacked relationship thereto being progressively larger in surface area with said plies being oriented with respect to each other whereby each ply disposed adjacent a next smaller size ply has a peripheral marginal edge portion extending a distance outwardly of the entire peripheral edge of that next adjacent smaller size ply, and an uncured rubber layer disposed in overlying relationship to the plies assembled in superposed stacked relationship at the side thereof adjacent said first ply, said uncured rubber layer being of a size in area to be at least coextensive with the largest of said plies for direct bonding of all of said first one of said plies and direct bonding of the peripheral marginal edge portion of each of the other of said plies to a tire casing.

4,408,650

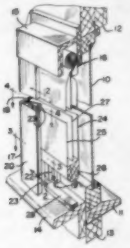
ROLL-DOWN WINDOW INSULATION

John T. Verch, Rice Lake, Wis., assignor to Nichols-Homeshield, Inc., Aurora, Ill.

Filed Apr. 8, 1982, Ser. No. 366,525

Int. Cl.³ E06B *9/08*

U.S. Cl. 160—121 R **3 Claims**



1. A window insulating multiple film curtain installation comprising a top mounting roller for the film curtain, a rigid bottom bar for the film curtain, said curtain including at least two films spaced apart and secured at the top to the roller and at the bottom engaged with said bar, a guide track at each side edge of the film curtain, each track having opposite guide walls, said film curtain operating vertically in said guide tracks, and a pair of flexible sealing members in each of said guide tracks for association with the respective films, said sealing member being deflected by said rigid bar as the film curtain is moved downwardly in said tracks with the films entering behind the deflected sealing members as the bar passes and then pressed by the sealing member against a guide wall of the track, at least one intermediate film disposed between said two films and which floats freely between said sealing members.

4,408,651

HOT CHAMBER DIE-CASTING

Dennis Smedley, Walsall, and Noel C. Spare, Nauton Beauchamp, nr. Pershore, both of England, assignors to Promagco Limited, Staffordshire, England

Filed Mar. 3, 1980, Ser. No. 126,352

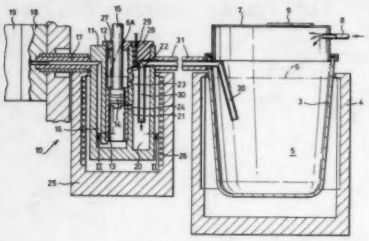
Claims priority, application United Kingdom, Mar. 21, 1979, 7909934

Int. Cl.³ B22D *17/04*

U.S. Cl. 164—316 **3 Claims**

1. A gooseneck assembly for hot chamber die-casting, said assembly comprising a shot cylinder with an upright axis, an injection duct leading in a direction from the bottom of said cylinder upward along a side of said cylinder to a substantially horizontal nozzle which extends in a direction away from said cylinder and which is provided with a connection to a die, a separate reservoir of molten metal which is closed from the atmosphere by a closure member which is removable from the top of said reservoir independently of said cylinder whereby said reservoir can be serviced without removing said cylinder, means connecting said reservoir to the interior of said cylinder,

means for supplying molten metal to the interior of said reservoir from a separate source of molten metal, means for maintaining a common protective atmosphere in the top of said reservoir and in the top of said cylinder, a piston which is movable downwardly in said cylinder from an upper to a lower position to perform a working stroke and to displace a shot of said molten metal out of said cylinder through said injection duct and nozzle into said die, and means for moving said piston between said upper and lower positions wherein said cylinder and said reservoir are formed as an integral unit with a common bottom wall and with said reservoir positioned



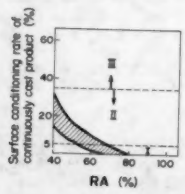
only at one side of said cylinder remote from said injection duct, said cylinder interior and said reservoir interior being separated by a partition wall which extends upwards from said bottom wall and which is provided with a first passageway interconnecting said reservoir interior and said cylinder interior at a position spaced above the bottom of said reservoir and adjacent to but below said piston when in said upper position, a second passageway in said partition wall interconnecting said reservoir interior and said cylinder interior at a position spaced below the top of said reservoir and above said piston when in said upper position.

4,408,652

METHOD OF CONTINUOUSLY CASTING NICKEL CONTAINING STEEL WHEREIN SURFACE CRACKS ARE PREVENTED

Chiaki Ouchi, Yokohama, and Tetsuya Sampei, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 286,032
Claims priority, application Japan, Jul. 23, 1980, 55-99833
Int. Cl.³ B22D *11/00*; C22C *38/06*
U.S. Cl. 164—459 **7 Claims**



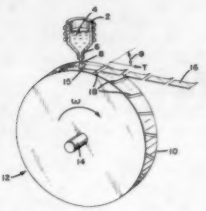
1. An improved method of continuously casting nickel-containing steel wherein the formation of surface cracks is prevented comprising continuously casting molten nickel steel in the form of a continuous casting, the improvement wherein said molten nickel-containing steel comprises less than 0.0020% S, less than 0.0045% N, Ca in an amount from 0.0020 to 0.0070%, Ni in an amount from 5.5 to 10%, the remainder being Fe and unavoidable impurities.

4,408,653

METHOD FOR MAKING SERRATED METAL RIBBON

Louis F. Nienart, Bloomsbury; Richard G. Fehrman, Mine Hill, both of N.J., and Chung-Chu Wan, Diamond Bar, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 9, 1981, Ser. No. 319,515
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—463 **5 Claims**



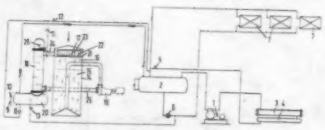
1. In a method of melt spinning or casting metal ribbon wherein a stream of molten metal is impinged on a chill surface and is ejected from the surface by centrifugal force in the form of a metal filament, the improvement comprising providing at least one groove in the chill surface, the longitudinal axis of said groove run transverse to and is orientated at an angle between about 25° and 70° with respect to the direction of travel of the chill surface.

4,408,654

ACCUMULATOR FOR STORING HEAT OR COLD

Cornelis Doomernik, Berghem, Netherlands, assignor to Doomernik B.V., Netherlands

Filed Jul. 2, 1980, Ser. No. 164,540
Claims priority, application Netherlands, Jul. 5, 1979, 7905277
Int. Cl.³ F28D *21/00*
U.S. Cl. 165—10 **5 Claims**



1. An accumulator for heat or cold, comprising a container filled for the greater part with a layer of buffer material melting at a constant temperature and a considerably smaller layer of heat transfer liquid having a lower melting point than the buffer material and a specific gravity lower than both that of the solid and that of the liquid buffer material, said transfer liquid being virtually immiscible with the buffer material, the container having a conduit for discharging heat transfer liquid from said layer at a location near the top of the container to devices outside the accumulator, a supply conduit for returning heat transfer liquid to a distributor near the bottom of the layer of buffer material for causing the transfer liquid to flow upwardly in direct contact with the buffer material, at least one coalescer comprising a mat of knitted threads or wires united into a spatial network between the buffer material and the outlet for the heat transfer liquid for retaining solid and liquid particles of the buffer material which otherwise may be entrained with the discharged transfer liquid, said buffer material being water or a eutectic aqueous solution of one or more salts having a melting point less than or equal to 0° C.

4,408,655

HEAT PIPE

Michitaka Hashimoto, and Koichiro Fukui, both of Tochigi, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Dec. 14, 1981, Ser. No. 330,474
Claims priority, application Japan, Nov. 18, 1981, 56-185906
Int. Cl.³ F28D 15/00
U.S. Cl. 165—104.27 5 Claims

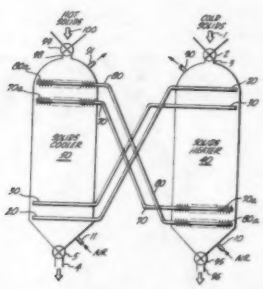
1. A heat pipe comprising an iron container having enclosed therein an aqueous solution of a vanadate as a working liquid.

4,408,656

COUNTERCURRENT HEAT EXCHANGER FOR TWO STREAMS OF SOLIDS USING HEAT PIPES

Octave Levenspiel, and Riley T. Chan, both of 1634 NW. Crest Pl., Corvallis, Oreg. 97330

Filed Sep. 3, 1981, Ser. No. 299,296
Int. Cl.³ F28D 15/00
U.S. Cl. 165—1 7 Claims



1. An apparatus for transferring heat continuously in countercurrent flow from a stream of relatively hot solid materials to a stream of relatively cold solid materials, both streams being gravity fed, comprising:

a cooling section for containing said relatively hot solid materials which are passing therethrough, said cooling section having a hot solids inlet and a cooled solids outlet and having a plurality of heat pipes arranged therein for contacting a cascade of said relatively hot solid materials, whereby heat is transferred from said relatively hot solid materials to said heat pipes; a heating section for containing said relatively cold solid materials which are passing therethrough, said heating section having a cool solids inlet and a heated solids outlet and having continued portions of said plurality of heat tubes arranged therein for contacting a cascade of said relatively cold solid materials, whereby heat is transferred from said heat tubes to said relatively cold solid materials;

each of said heat pipes forming an enclosed vessel containing a heat transfer fluid which is vaporized in the portion of the heat pipe located in said cooling section and condensed in the portion of the heat pipe located in said heating secition, thereby transferring heat from the stream of hot materials to the stream of cold materials said heat pipes further being arranged so that those of said heat pipes positioned in said cooling section at the top thereof transfer heat to a position in said heating section at the bottom thereof.

5. A method for transferring heat in an essentially countercurrent fashion from relatively hot solid materials to relatively cold solid materials, comprising:

cascading said relatively hot solid materials flowing downwardly in a first vessel over a plurality of heat pipes; said heat pipes each forming an enclosed vessel containing a heat transfer fluid which is vaporized by heat transferred thereto from said cascading of hot materials thereover;

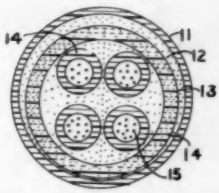
cascading said relatively cold solid materials flowing downwardly in a second vessel over a different portion of said heat pipes wherein said heat transfer fluid is condensed releasing heat which is transferred to said cold solid material, said heat pipes being arranged so that heat from solid material adjacent the inlet to said first vessel is transferred to material adjacent the outlet of said second vessel; whereby countercurrent heat transfer occurs between said relatively hot and cold solid materials.

4,408,657

METHOD FOR TRANSPORTING LOW TEMPERATURE HEAT LONG DISTANCES

Paul F. Pugh, 4082 Sequoyah Rd., Oakland, Calif. 94605

Filed Jan. 19, 1981, Ser. No. 225,868
Int. Cl.³ F28D 13/00
U.S. Cl. 165—1 6 Claims



1. A method for transporting low temperature thermal energy underground from distant geothermal, solar, or waste heat processing plants by means of a system comprising;

an air compressor which compresses ambient air to 100 to 400 pounds per square inch gauge pressure with a controlled specific heat of said air from 0.1 to 0.5;

said compressed air passing through a heat exchanger which raises the temperature of said air;

said air continuing through one or more pressurizable non-metallic enclosures to a utilization point;

said enclosure being surrounded by an outer dry insulating spacer filled with dry compressed air, and a pressurizeable outer non-metallic enclosure; and

said outer enclosure directly buried in the earth.

4,408,658

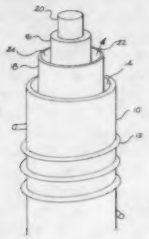
APPARATUS AND METHOD FOR HEATING A MATERIAL IN A TRANSPARENT AMPOULE

Lawrence R. Holland, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1981, Ser. No. 280,151
Int. Cl.³ H05B 1/00; F27D 11/00; C30B 1/00, 35/00
U.S. Cl. 165—2 4 Claims

1. In a process for heating a material within a transparent ampoule by radiation through the wall of the ampoule, the improvement of disposing the ampoule within a sleeve, wherein the sleeve is of a material having similar spectral properties to that of said ampoule, passing a cooling gas between the ampoule and the sleeve to chill the outside of the

ampoule while the temperature of the material within the ampoule is raised to thereby increase the temperature of the material within the ampoule above the strain point of the ampoule without rupturing the ampoule.



4,408,659

HEAT STORAGE MASS FOR REGENERATIVE HEAT EXCHANGE

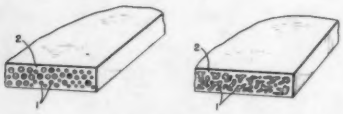
Bernd Hermanns, and Stanislaw Michalak, both of Reichshof, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 311,046

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038723

Int. Cl.³ F28D *19/00*

U.S. Cl. 165—10 **2 Claims**



1. A regenerative heat exchanger for cooling hot gas streams and heating cool gas streams with heat extracted from the hot gas streams, the heat exchanger comprising: a fluidized bed through which both the cool and hot gases pass, the fluidized bed including a plurality of individual elements, wherein each element comprises a hollow body having a wall comprising a carrier material having a relatively high thermal conductivity and resistance to destruction by the gases, the wall having a plurality of spaces therein, and a material of high heat storage capacity sealed within the spaces.

4,408,660

VEHICLE HUMIDITY CONTROL APPARATUS FOR PREVENTING FOGGING OF WINDOWS

Shinji Sutoh, Konan; Toshizo Hara, Higashi Matsuyama; Takeshi Harada, Higashi Matsuyama, and Masahiro Eda, Higashi Matsuyama, all of Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Oct. 20, 1980, Ser. No. 198,429

Claims priority, application Japan, Oct. 20, 1979, 54-135535

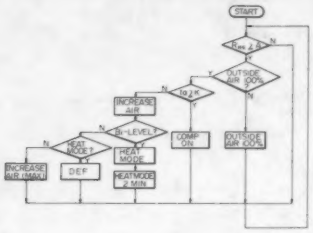
Int. Cl.³ F24F *3/14*; G05D *23/00*; B61D *27/00*

U.S. Cl. 165—21 **5 Claims**

1. A vehicle interior humidity control apparatus including window inner surface humidity sensor means for sensing a window inner surface humidity and interior air control means, characterized by comprising:

system control means responsive to the humidity sensor means for controlling the air control means in such a manner that when the humidity rises above a predetermined humidity value the air control means increases a proportion of outside air in inlet air to a maximum value;

the air control means further comprising cooling means, the apparatus further comprising air temperature sensor means for sensing an outside air temperature, the system control means being responsive to the temperature sensor means for controlling the air control means in such a manner that when the proportion of outside air is at the maximum value, the humidity is above the predetermined humidity value and the air temperature is above the predetermined temperature value, the cooling means is energized; and when the air temperature is below the predetermined temperature value the air control means increases an amount of inlet air.



4,408,661

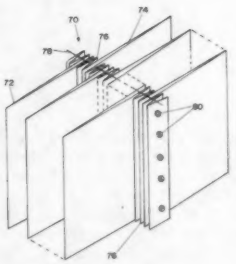
CABINET COOLER HEAT EXCHANGER

George Y. Eastman, Lancaster; Donald M. Ernst, Leola, and Warren E. Thomas, Lancaster, all of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed Sep. 28, 1981, Ser. No. 306,079

Int. Cl.³ F28D *9/00*; F28F *1/42*

U.S. Cl. 165—164 **1 Claim**



1. In a stacked plate heat exchanger of the type comprising conductive fins extending into both a first and a second isolated environment and conducting heat between the isolated environments, the improvement comprising:

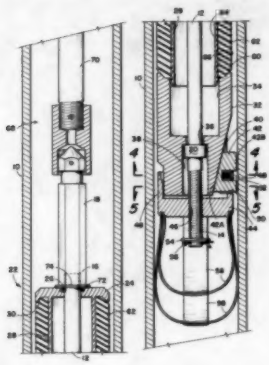
an assembly of fins, of equal width mounted together in a configuration with the planes of all fins parallel to each other and their edges in alignment, with alternate fins extending into the first environment and the remaining fins extending into the second environment, and with a portion of the length of each fin overlapping the adjacent fins, comprising a continuous folded sheet assembly forming both the heat exchange fins and heat conductive spacers between adjacent fins, by the use of long lengths of heat conductive material between alternately directed folds to form the fins and several short lengths of heat conductive material between alternately directed folds to form the spacers.

4,408,662

RETRIEVABLE PACKER FOR OIL WELL CASING

Billy G. Shearhart, Nowata, Okla., assignor to Sooner Oil Tools, Inc., Nowata, Okla.

Filed Jul. 27, 1981, Ser. No. 287,367
Int. Cl.³ E21B 33/128, 33/129
U.S. Cl. 166—124 5 Claims



1. A retrievable packer for the casing of a well comprising:

an elongated central shaft being threaded at the lower end and having means at the upper end for attachment of insertion or retrieval tools;

an upper body portion providing an upper flange having an opening therein rotatably receiving said shaft and having a downwardly extending tubular sleeve, the outer diameter of the sleeve being less than the outer diameter of the flange portion providing an upper annular gland surface therearound;

a lower body portion having an opening therethrough receiving said shaft, the upper portion of the opening slideably receiving said sleeve, the upper end of the lower body providing a lower annular gland surface, the lower exterior portion of the lower body having a plurality of spaced apart slots therein each having an inner surface which tapers inwardly towards the body lower end;

a slip member slidably positioned in each of said slots in said lower body portion, each slip having an inner tapered surface engaging the slot tapered surface and having an irregular outer surface for non-slidably engaging a casing in which the packer is positioned;

a base plate having a threaded opening therein receiving the threaded portion of said shaft, the upper end of the base plate engaging said slip members; and

a tubular packing gland of elastomeric material received about said sleeve with the upper end thereof in engagement with said upper body portion gland surface and the lower end thereof in engagement with said lower body portion annular gland surface whereby when said shaft is rotated one direction said bottom plate is upwardly advanced to force said slips outwardly to engage the interior of a casing and to compress said packing gland to expand outwardly to sealably engage the interior of a casing and when said shaft is rotated in the opposite direction to move said base plate in the downward direction to release compressive force and said packing gland to allow it to contract and to cause said lower body member to be upwardly displaced relative to said slips whereby said slips are radially inwardly retracted allowing the packer to be removed from the casing.

4,408,663

PROCESS FOR ENLARGEMENT OF ROCK FRACTURES

Peter W. John, An der Wedel 5, 3006 Burgwedel 1, Fed. Rep. of Germany

Filed Sep. 9, 1981, Ser. No. 300,544
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037807
Int. Cl.³ E21B 43/263, 43/267
U.S. Cl. 166—259 8 Claims

1. Process for the controlled enlargement of a rock fracture, comprising the steps of

(a) placing an aluminothermic mixture of aluminum and ferric oxide of pumpable grain size having a predetermined concentration distribution of detonation bodies spaced from one another into said fracture;

(b) introducing into said fracture a high pressure fluid which acts as a carrier to place said mixture and said distribution of detonation bodies as said fluid is pumped, whereby said fracture is created and enlarged and a detonation body distribution adapted to a characteristic signal pattern is produced; and

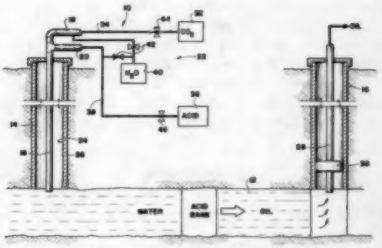
(c) igniting said mixture.

4,408,664

SECONDARY OIL RECOVERY METHOD

Harold P. Santee, Skiatook, Okla., assignor to Jack H. Santee; Robert P. Santee and Catherine A. McAfee, all of Tulsa, Okla.

Filed Sep. 26, 1980, Ser. No. 184,255
Int. Cl.³ E21B 43/20, 43/27
U.S. Cl. 166—263 6 Claims



1. Method of oil recovery from subterranean formations penetrated by at least one injection well and a production well comprising the steps of:

establishing a rate of oil production for the formation as a function of formation characteristics;

injecting into said injection well a bank of water solution containing carbon dioxide gas and a dissolved citric and phosphoric acid solution; and

driving said bank from said injection well to said production well and withdrawing oil from said production well at said established rate of oil production.

4,408,665

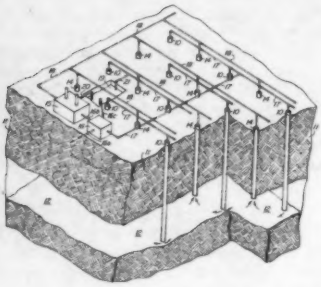
IN SITU RECOVERY OF OIL AND GAS FROM WATER-FLOODED OIL SHALE FORMATIONS

Paul N. Dougan, County of Salt Lake, Utah, assignor to Equity Oil Company, Salt Lake City, Utah

Continuation-in-part of Ser. No. 793,404, May 3, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,994
Int. Cl.³ E21B 43/24, 43/40
U.S. Cl. 166—266 11 Claims

1. An in situ process for recovering shale oil and gas from a naturally water-flooded, naturally porous zone in a subterranean oil shale formation, comprising drilling at least one injection borehole and at least one extraction borehole into such a

naturally water-flooded, naturally porous zone of the subterranean oil shale formation; injecting superheated steam through said injection borehole and into said water-flooded zone of the oil shale formation to heat the oil shale and the water in said zone and to convert kerogen in the heated oil shale to shale oil in liquid or vapor form; collecting in and carrying along with the water in said zone, and with water resulting from the condensation of the injected steam, the shale oil and any gas occurring therewith; and withdrawing the mixture of shale oil, gas, and carrier water from the said zone through said extraction borehole.



8. A plant for recovering shale oil products from a naturally water-flooded, naturally porous zone of a subterranean oil shale formation, comprising at least one injection borehole extending from the surface of the earth into said zone; at least one recovery borehole extending from the surface of the earth into said zone in spaced relation to said injection borehole; means for generating superheated steam and passing it into said at least one injection borehole; and means for receiving and separating a mixture of shale oil products and carrier water recovered from said at least one recovery borehole.

4,408,666

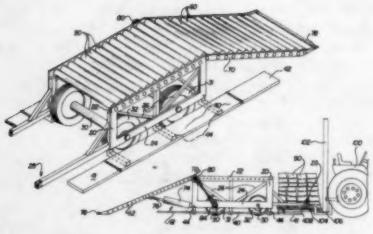
SOD HANDLING APPARATUS

Charles L. Lawson, 612 Dundee Cir., Melbourne, Fla. 32901

Filed Oct. 28, 1981, Ser. No. 315,744

Int. Cl.³ A01B *45/04, 75/00;* **A01D** *90/10*

U.S. Cl. 172—19 **10 Claims**



1. An apparatus for handling sod, comprising in combination: a frame having wheels for moving along the ground, said frame having a front end adapted to receive a pallet of sod adjacent thereto;

conveyor means coupled with said frame for transporting pieces of sod between the pallet of sod and the ground; and

a pair of foot supports attached on either side of said frame for allowing workers handling the sod to move therealong, with said foot supports extending forward from adjacent a rear end of said conveyor means, past said front end of said frame to adjacent the pallet of sod.

4,408,667

AGRICULTURAL SHARES

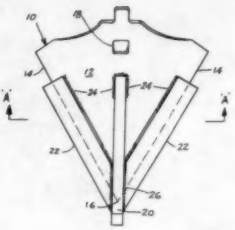
Henry F. Jarvis, 21 Fermaner St., Karrinyup, Western Australia, Australia

Filed May 28, 1981, Ser. No. 267,807

Claims priority, application Australia, Jun. 20, 1980, PE4344; Dec. 23, 1980, PE7046

Int. Cl.³ A01B *23/00, 39/22*

U.S. Cl. 172—722 **8 Claims**



1. An unworn agricultural share formed of metal having a front and rear and two sides converging together to form a point and a mounting aperture located remote from the point, wherein a first, separate central protective metal length is secured by welding to the front of the share extending rearwardly from the point substantially equidistant from the sides of the point and in alignment with the mounting aperture, and second and third separate lateral protective metal lengths each have a forward end and inner and outer edges extending rearwardly from said forward end are secured by welding to the front of the share, wherein each said lateral protective metal length extends rearwardly from adjacent the point, the forward end of each lateral protective metal length is located adjacent to a side of the central protective metal length and is shaped so as to be substantially parallel with the adjacent side of the center protective metal length, the outer edge of each lateral protective metal length extends generally parallel to a respective side of the share and said outer edges of the lateral protective metal lengths are disposed at least as far outwardly as said respective sides of the share, the inner edge of each lateral protective metal length diverges away from an intermediate point on a side of the central protective metal length such that there is a depression between the central protective metal length and the inner edge of each lateral protective metal length, and said center protective metal length is fixed in position such that its position cannot be adjusted without first breaking the weld by which it is secured to the front of the share.

4,408,668

IMPACT TRANSFER DEVICE FOR POWER RAMS

Hans Kühn, Hamburg, and Arno Viecenz, Quickborn, both of Fed. Rep. of Germany, assignors to Koehring GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,942

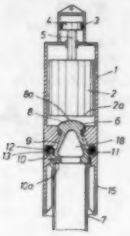
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006234

Int. Cl.³ B25D *17/06*

U.S. Cl. 173—139 **27 Claims**

1. An impact transfer device for use between a hammer of a pile driver and a pile to be driven, comprising a solid percussion part having a substantially cylindrical configuration and a convex impact surface to be directly hit steel-on-steel by the hammer without interposed buffer means, an intermediate part in the form of a substantially frustoconical tubular piece di-

verging from that side of said solid percussion part facing away from said impact surface, and a reinforcing base ring formed on that end of said frustoconical tubular wall distant from said



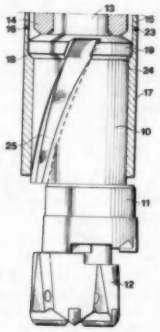
percussion part, said base ring having on its side facing away from said impact surface an annular support surface for unbuffered impact transmission to the pile.

4,408,669

MEANS FOR DRILLING

Harry A. I. Wiredal, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sweden

Filed Apr. 24, 1978, Ser. No. 899,170
Claims priority, application Sweden, Apr. 29, 1977, 7704972
Int. Cl.³ E21B *10/26, 1/02*
U.S. Cl. 175—258 **2 Claims**



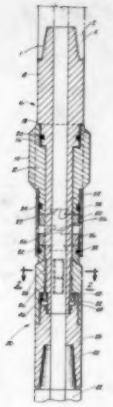
1. Means for drilling of the type comprising a rotatable drilling tool adapted to drill a hole in advance of a trailing casing tube means which are moved by rotatable drill rod means, said casing tube means having a forward mouth portion with a cylindrical interior surface, said drill rod means and said casing tube means having an annular space therebetween, said drilling tool comprising a central bit, an eccentrically disposed reamer cutting edge means in axial proximity rearwardly of said bit, characterized by a cylindrical guide body in coaxial relation to said bit, the forward portion of said guide body having such a diameter as to provide sliding engagement with the interior cylindrical surface of said mouth portion of said casing tube means, said guide body having a plurality of rearwardly-extending recesses in the cylindrical surface of its forward portion for the discharge of drilling debris rearwardly to said annular space provided between said rotatable drill rod means and said casing tube means, said recesses being U-shaped in cross-section and the width of each said recess exceeding the radial depth thereof, said drilling tool and said guide body being connected to a rotatable drill tube associated with a down-the-hole drilling machine and said casing tube having at its lower end a thickened mouth portion providing an upward annular driving shoulder for cooperation with a flange on said guide body for transmitting impacts to said casing tube, characterized in that said rearwardly extending recesses extend along said forward portion of said guide body and also pass axially through said flange on said guide member.

4,408,670

IMPACT CAM SUBASSEMBLY FOR DRILLS

William N. Schoeffler, 3600 E. Simcoe, Apt. 8, Lafayette, La. 70501

Filed Apr. 24, 1981, Ser. No. 257,366
Int. Cl.³ E21B *4/10*
U.S. Cl. 175—298 **7 Claims**



1. An impact cam sub assembly for drill strings comprising:
a driving member adapted to be attached to a drill string to be rotated thereby;
a drill holder longitudinally slidable on the lower end of said driving member but non-rotatable relative thereto;
a stabilizer sleeve rotatable about the upper portion of said driving member and having means thereon engageable with the sides of a well bore for resisting rotation of said stabilizer sleeve when said driving member rotates;
interchangeable substantially identical cams, one of which is fixed to said stabilizer sleeve, and the second cam fixed to said drill holder and cooperating with said first cam to longitudinally reciprocate said stabilizer sleeve and drill holder relative to each other; and
cooperating shoulders on said driving member and stabilizer sleeve arranged to exert an upward thrust on said driving member and drill string upon upward movement of said stabilizer sleeve relative to said drill holder.

4,408,671

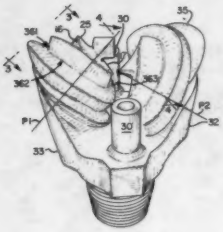
ROLLER CONE DRILL BIT

Beauford E. Munson, P.O. Box 3047, Butte, Mont. 59702

Continuation of Ser. No. 143,340, Apr. 24, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,280
Int. Cl.³ E21B *10/16*
U.S. Cl. 175—377 **7 Claims**

1. A roller bit for use with drilling strings in the penetration of earth, as in drilling through rock formations, said roller bit comprising first and second roller cone cutters, each of said roller cone cutters formed in a generally conical configuration and having a base and an apex, said first roller cone cutter revolving around a first axis, said second roller cone cutter revolving around a second axis, said first and said second roller cone cutters each having a plurality of teeth extending in planes about the perimeter of each of said roller cone cutters, said teeth extending generally from the base toward the apex of

each of said roller cone cutters, the spacing between adjacent teeth on the same roller cone cutter increasing as said adjacent



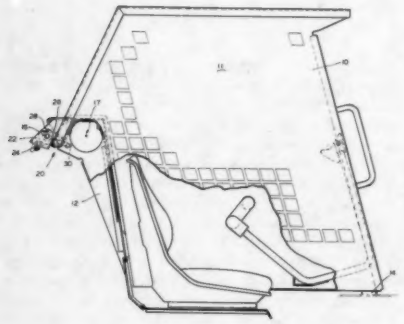
teeth extend from said base of said roller cone cutter toward said apex thereof, thereby allowing larger cuttings and increased cleaning action of said cutter.

4,408,672

LATCH MECHANISM FOR A SKID-STEER LOADER WITH A ROLL OVER PROTECTIVE STRUCTURE HAVING A TILT-BACK CAPABILITY

Larry E. Albright, and Lonnie D. Hoechst, both of Gwinner, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 26, 1981, Ser. No. 228,646
Int. Cl.³ B62D *27/04*
U.S. Cl. 180—89.14 **4 Claims**



1. An improved latch mechanism for a skid-steer loader wherein the loader includes:

a frame structure;

a cab enclosure or Roll Over Protective Structure (ROPS) pivotally mounted at the rear and fastened at the front of the frame structure;

biasing means between the cab enclosure and the frame rotatably biasing the cab enclosure up and away from the frame wherein the latch mechanism comprises a cam member having an arcuate surface mounted on the frame;

a latch member comprising an elongated plate mounted on the cab enclosure and having an end surface of the plate engaging the arcuate surface of the cam member;

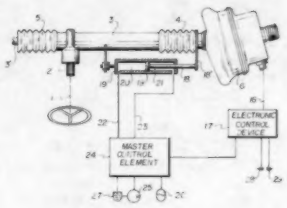
biasing means associated with the latch member biasing the edge portion of the latch plate into engagement with the arcuate surface of the cam member and retaining such latch plate in engagement with the arcuate portion of the cam member as the cab enclosure is rotated about the frame structure at the rear of the cab enclosure and a gap or notch provided in the arcuate surface of the cam member to receive the latch plate when the cab enclosure is fully rotated about the frame structure at the rear of the cab enclosure to retain the cab enclosure in a fixed position away from the frame.

4,408,673

SPEED-CONTROLLED SERVO-ASSISTED STEERING APPARATUS

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 59,354, Jul. 20, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,246
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838152
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—141 **11 Claims**



1. A servo-assisted power steering apparatus and system for motor vehicles comprising

a steering gear including a steering housing, said steering gear including a rack coupled to a steering knuckle assembly for steering a vehicle,

a servo apparatus including a servo cylinder and piston therein with the servo cylinder supported from said steering housing and said piston is coupled by a rod and a crosspiece to said rack coupled to said steering knuckle assembly,

said steering knuckle assembly including an electrical control means,

a control device for processing signals picked up from said electrical control means and from engine speed sensors for producing an output signal,

a master control element for controlling the servo apparatus in response to an output signal of the control device, and

said electrical control means in the steering knuckle assembly having switching values fed to said control device in response to a position of said rack relative to said steering knuckle assembly.

4,408,674

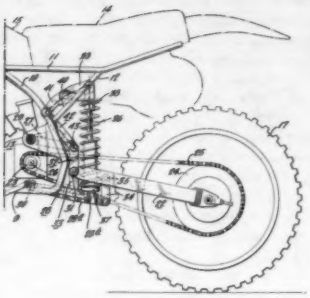
MOTORCYCLE DRIVE WHEEL SUSPENSION SYSTEM

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation-in-part of Ser. No. 351,630, Feb. 23, 1982, which is a continuation-in-part of Ser. No. 269,322, Jun. 1, 1981, abandoned. This application Apr. 14, 1982, Ser. No. 368,220
Int. Cl.³ B62K *25/04*
U.S. Cl. 180—227 **7 Claims**

1. In a motorcycle having a frame, a drive wheel, a motor, and wheel drive mechanism including a motor sprocket, a wheel sprocket, and a drive chain connecting the sprockets, a drive wheel suspension system comprising first and second levers pivotally mounted on fixed axes respectively spaced, one above and the other below the axis of the motor sprocket, first linkage pivotally interconnecting said levers on axes spaced to provide a first parallelogram linkage, a swing arm for the drive wheel pivotally connected with said first linkage on an axis between the axes of pivotal interconnection of said first linkage with the levers, one of said levers having an extension beyond the first linkage, a swing arm link pivotally interconnecting the swing arm and said extension and forming a second

parallelogram linkage with said first linkage, the swing arm and said lever extension, and a shock absorber connected with



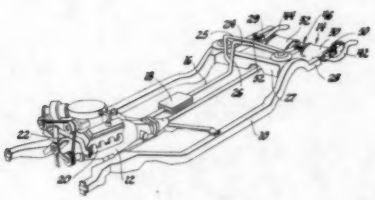
the wheel suspension system for resisting drive wheel deflection.

4,408,675

DUAL OUTLET ENGINE EXHAUST SYSTEM

Robert C. Keller, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 22, 1981, Ser. No. 266,171
Int. Cl.³ F01N 7/04
U.S. Cl. 180—296 **1 Claim**



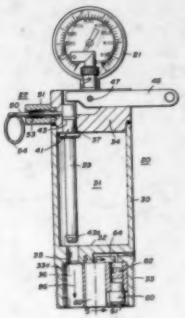
1. In a dual outlet engine exhaust system for an internal combustion engine mounted in a vehicle, an exhaust pipe extending from the engine, a pair of branch pipes connected to said exhaust pipe and extending rearwardly longitudinally and centrally of the vehicle in substantially parallel relationship, a pair of resonators each having an inlet and an outlet, said resonators being arranged end-to-end at their inlet end and transverse of the vehicle, mounting means mounting the outlet end of each resonator on the vehicle, a tail pipe connected to each outlet, and resonator manifold means including a gas separator located directly between the inlet ends of said resonators for both rigidly mechanically interconnecting said resonators while separately gaseously directly connecting their inlets to the respective branch pipes whereby said resonators form a rigid assembly and together with said tail pipes are mounted directly on the vehicle by only said mounting means at the outlet ends of said resonators and whereby the exhaust gases are divided by said branch pipes with such divided exhaust gases thereafter maintained separate from each other by said gas separator while passing through said resonators and thence separately out through said tail pipes to create a distinct exhaust sound.

4,408,676

GAS GUN ASSEMBLY

James N. McCoy, 5001 Ditto La., Wichita Falls, Tex. 76302

Filed Feb. 25, 1981, Ser. No. 237,860
Int. Cl.³ G01V 1/40
U.S. Cl. 181—113 **13 Claims**



8. A gas gun assembly for measuring depths of reflectors in a well bore comprising:

(a) A housing having an upper central chamber with a bottom bulkhead through which a first valve bore passes;

(b) coupling structure below said bulkhead for securing said housing to said well;

(c) a cap secured to close said chamber and having a second valve bore therethrough of diameter larger than the diameter of said first valve bore and located in axial alignment with said first valve bore;

(d) a valve stem having one end axially movable within said second valve bore while closing the same and the other end movable into and out of said first valve bore;

(e) means to establish a pressure differential across said bulkhead;

(f) means to release said valve stem for rapid equalization of pressure across said bulkhead thereby to produce an acoustic pulse in said well bore below said bulkhead; and

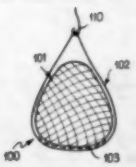
(g) lever means in said cap mounted to engage the head of said valve stem to force the lower end of said valve stem into said first valve bore.

4,408,677

METHOD AND APPARATUS FOR THE PRODUCTION OF SEISMIC SHOCKS

Jean-Joseph Roy, Veynes, France, assignor to Compagnie Generale de Geophysique, Massy, France

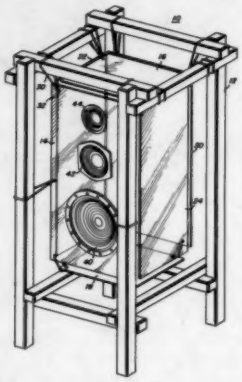
Filed Nov. 7, 1977, Ser. No. 849,022
Int. Cl.³ G01V 1/146, 1/109
U.S. Cl. 181—121 **3 Claims**



1. A method for producing shocks in the ground, comprising the step of releasing a mass for free fall from an aircraft from a height of between about 5 and 100 meters, said mass comprising a multiplicity of individual heavy elements connected together, and a base of large relative surface, said mass on

impact with the ground deforming without losing cohesion, said release step including the steps of: maintaining said base substantially plane by providing means for stiffening the base; and maintaining the base substantially horizontal at least after release and up to impact.

4,408,678
LOUDSPEAKER ENCLOSURE
Lahroy A. White, Jr., 4008 Pinehurst, Amarillo, Tex. 79109
Filed Feb. 19, 1982, Ser. No. 350,217
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—199 **9 Claims**

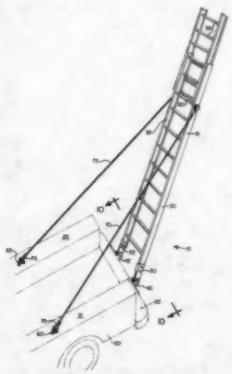


1. A loudspeaker enclosure comprising:
a front portion, side portions and a back portion,
said front portion adapted for emitting frontwave radiation from a loudspeaker,
said front, side and back portions being arranged to substantially contain the backwave radiation from said loudspeaker,
at least one of said front, side and back portions being formed of a panel, said panel being mechanically suspended such that it is adapted to be deflected by backwave radiation from said loudspeaker and thereby dissipate the energy thereof.

4,408,679
SOUND ATTENUATOR
J. Kerry Littrell, Redmond, Wash., assignor to Peabody Spunstrand, Inc., Seattle, Wash.
Filed Sep. 28, 1981, Ser. No. 306,190
Int. Cl.³ F01N *1/10, 7/18*
U.S. Cl. 181—243 **10 Claims**

1. A lightweight, corrosion resistant sound attenuator having replaceable sound attenuating material which may become contaminated, abraided or absorb moisture during use, the attenuator comprising:
a tubular housing comprising a lightweight plastic material, having two end portions and having an interior surface;
a layer of sound attenuating material having an outer side positioned in abutting relation with said interior surface of the tubular housing, said layer having an interior surface defining an axial flow passage through the housing, said layer being removeable to provide for replacement thereof;
a first annular ring inserted in and fixed to the interior surface of said housing at one end portion, said ring having a wall extending inwardly from the interior surface of the housing, said wall having an inward end, said wall retaining said layer against longitudinal sliding movement in one direction, said first ring including an interior transition surface converging from the interior surface of said housing radially and longitudinally inwardly to said inward end of said retaining wall, said first ring including a cyclindrical sleeve extending longitudinally from said inward end of said retaining wall to define a slot between it and said interior surface of said housing for retaining the end of said layer of sound attenuating material, said sleeve providing a smooth transition betwen said ring and the end of said layer;
a second annular ring fixed to the interior surface of the housing at the other end portion and having a wall extending inwardly from the interior surface of the housing for retaining said layer against longitudinal sliding movement in an opposite direction;
means for retaining said attenuating layer in abutting relation with the interior surface of the housing, said retaining means being removeable to provide for replacement of said sound attenuating layer.

4,408,680
LADDER SUPPORT ASSEMBLY
Don O. Ross, Rte. 1, Box 458, Gulfport, Miss. 39503
Filed Mar. 6, 1981, Ser. No. 241,250
Int. Cl.³ E06C *5/04, 7/46*
U.S. Cl. 182—68 **4 Claims**

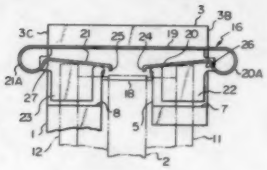


1. A ladder support assembly for use with vehicles comprising:
a ladder having a pair of spaced apart generally parallel rails, a plurality of rungs connecting said rails, and a rearwardly facing L-shaped slot in the bottom portion of each of said rails;
a bottom part on said rails substantially the width of said rails for gripping the ground whereby said ladder may be supported on the ground in a conventional manner when not supported by said vehicle;
a pair of support brackets, each comprising a pair of spaced apart cantilevered sections forming a channel with a support pin across the channel adapted to engage said slots; and
at least two flexible tensile support cables, each attached during operation at one end portion to said ladder between the end portions thereof and at the other end portion having means for removably affixing each of said cables to said vehicle body to thereby determine the angle formed by the ladder and the vehicle chassis.

4,408,681
DISC BRAKE

Harumi Oshima, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jun. 17, 1981, Ser. No. 274,452
Claims priority, application Japan, Jun. 23, 1980, 55-87846[U]
Int. Cl.³ F16D 65/02
U.S. Cl. 188—73.38 3 Claims



1. A disc brake comprising:

a stationary member adapted to be secured to a non-rotatable part of a vehicle at one side of a rotatable disc and including a pair of legs spaced in the direction of the circumference of the disc, said legs straddling the outer circumference of the disc to extend to the other side of the disc and having respectively pad guiding portions extending in a direction parallel to the axis of the disc, each of said pad guiding portions being interrupted by a circumferential groove in each of said legs which rotatably receives the outer circumference of the disc;

a pair of friction pads disposed on the opposite sides of the disc and supported slidably on the guiding portions; and

a pad spring retained on the stationary member for biassing the friction pads against the pad guiding portions, said pad spring comprising a main body portion retained on said stationary member, generally arcuate portions connected to axial ends of the main body portion, and pressing portions connected respectively to respective arcuate portions and extending axially inwardly and radially inwardly therefrom in inclined fashion, said pressing portions pressing respective friction pads radially inwardly and in the direction separating the friction pads from the disc, said arcuate portions and said pressing portions defining therebetween stops which act to prevent the movement of the friction pads in the direction separating the friction pads from the disc.

4,408,682
RAIL VEHICLE SLACK ADJUSTER

Lars M. Severinsson, Hishult; Peter Beijbom, Lund, and Anders K. Martensson, Bjärred, all of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

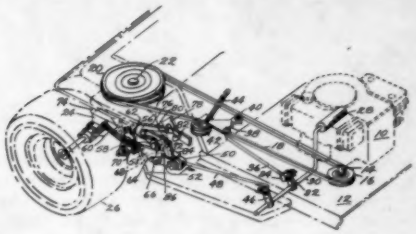
Filed Jun. 10, 1981, Ser. No. 272,182
Claims priority, application Sweden, Jun. 24, 1980, 8004669
Int. Cl.³ F16D 65/66
U.S. Cl. 188—202 4 Claims

1. A rail vehicle slack adjuster of the axial type, comprising in combination, an elongated barrel (4), a pull rod (6) and a threaded spindle (2) extending out of the barrel from its opposite ends, an adjuster mechanism contained in the barrel for cooperation with the pull rod and the spindle, said barrel comprising sheet metal with at least one circumferential notch retaining therein against axial movement along the barrel an element for engaging and coacting with a mating element of the adjuster mechanism thereby to stop axial movement thereof relative to the barrel notch.

4,408,683
COMBINED CLUTCH AND BRAKING ARRANGEMENT FOR A TRACTOR

Raymond L. Elmy, Franklin, and Joe Crabtree, Lewisburg, both of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.

Filed Feb. 16, 1978, Ser. No. 878,448
Int. Cl.³ F16D 13/76, 67/02; G05G 9/08
U.S. Cl. 192—11 3 Claims



1. A combined clutch and braking arrangement for a powered tractor comprising:

a pedal adapted to be depressed and released;

means operatively joined to said pedal and responsive to an initial depression thereof to interrupt a power transfer path arranged to move said tractor, said power transfer path including: an idler pulley operatively connected to said pedal and movable as the pedal is depressed and released, and a drive belt engaged by said idler pulley and retained in operative relationship with a drive pulley when said pedal is released, said drive belt being removed from operative relationship with the drive pulley when the pedal is depressed;

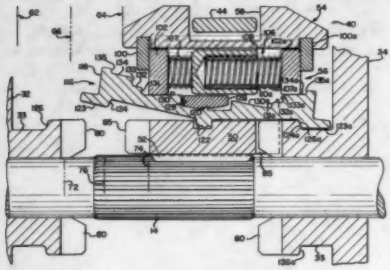
additional means operatively joined to said pedal and responsive to further depression thereof to brake the tractor, said braking means including: a connecting rod operatively joined at one of its ends to said pedal, a link plate provided with a first slot, means received within said slot for joining the other end of said rod to the link plate, said slot being dimensioned such that during the initial depression of the pedal said joining means moves freely within the slot and during the further depression of the pedal said joining means engages an end of the slot to displace the plate, and means connected to said plate and responsive to plate displacement for actuating the brakes of said tractor; and

manually operative means to brake the tractor independently of depression and release of said pedal, said manually operative braking means including: handle means operatively connected to said link plate and movable between first and second positions for displacing said plate independently of movement of the connecting rod to operate said brake actuating means, and means received within an additional slot in said link plate for connecting the handle means to said link plate, said slot extending substantially parallel to said first slot and being dimensioned such that when said pedal is released and the handle means is in said first position, the handle connecting means is positioned adjacent an end of the additional slot whereby movement of the handle means towards said second position displaces the link plate, and when said pedal is depressed and the handle means is in said first position, the handle connecting means is located intermediate the ends of said additional slot.

4,408,684
SEQUENCE SHIFTING COUPLING

Radisko S. Gladich, Willowbrook, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Feb. 25, 1981, Ser. No. 238,387
Int. Cl.[3] F16D *23/02, 11/10, 13/71*
U.S. Cl. 192—53 G 10 Claims



1. An improved clutch means having movable parts including a coupling element aggregated together for selectively engaging a gear on a rotatable shaft, said clutch means incorporating mechanical logic determinative for selective operation comprising a fixed mass value of said movable parts;

spring means having a biasing force capability related to and depending on a plurality of variables including said fixed mass value of said movable parts; and

teeth means on said coupling element having tooth shapes relating to and depending on a plurality of variables including said fixed mass value of said movable parts and said spring means biasing force;

said fixed mass value is the mass of said improved clutch means including said coupling element and said spring means; and

a rocker pivotably mounted on said coupling element and lockingly engageable with said gear for conjoint rotation of said coupling element with said gear.

4,408,685
FLUID SET AND SPRING RELEASED CLUTCH

Hugh K. Schilling, St. Paul, and Charles D. Raines, Bethel, both of Minn., assignors to Horton Industries, Inc., Minneapolis, Minn.

Filed Nov. 13, 1980, Ser. No. 206,362
Int. Cl.[3] F16D *25/063*
U.S. Cl. 192—85 A 10 Claims

1. A fluid engaged and spring disengaged clutch comprising:

(a) a hub,

(b) means for securing said hub to a shaft to be driven,

(c) a pulley,

(d) means rotatably mounting said pulley on said hub,

(e) said hub having a radially extending integral flange portion,

(f) means mounting an annular piston on said radially extending flange for slidable movement relative to said flange,

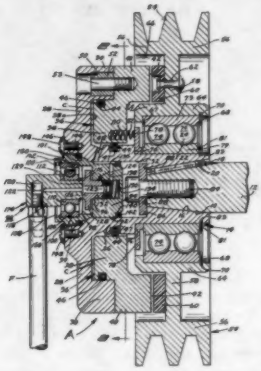
(g) annular friction facing means,

(h) means mounting said friction facing means in an annular recess formed in said pulley inwardly of the radially and outwardly extent of said pulley for engagement by

(i) an integral annnular extension of said piston, with the annular piston mounting means including: an annular lip formed on said flange and having a series of spaced holes formed therethrough, with the annular lip, the radially extending flange, and the hub forming a piston cavity for the reciprocal receipt of the piston, and a series of spaced torque bolts mounted on one end on said flange and extending freely through the holes of said lip with the other ends of said bolts secured in said extension of said piston,

(j) a rotary air union,

(k) means rotatably mounting said hub on said rotary air union,



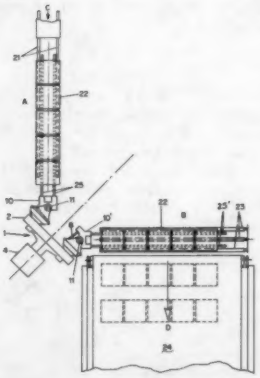
(l) spring means located between said piston and said hub for urging said piston and extension thereon from contact with said friction facing means, and

(m) means for introducing fluid pressure from the rotary air union between said piston and said radially extending flange to cause said piston extension to contact said friction facing means for driving said shaft.

4,408,686
APPARATUS FOR TRANSFERRING ARTICLES FROM ONE CONVEYING LINE TO ANOTHER CONVEYING LINE WHOSE DIRECTIONS ARE ANGULARLY SPACED

Andrea Taverna, Florence, Italy, assignor to Gabbrielli Impianti di Gabbrielli Franco & C.s.a.s., Florence, Italy

Filed Feb. 24, 1981, Ser. No. 237,798
Claims priority, application Italy, Mar. 6, 1980, 9374 A/80
Int. Cl.[3] B65G *47/26, 47/24*
U.S. Cl. 198—433 8 Claims



1. An apparatus for transferring objects from one conveying line to another conveying line, the directions of which form an angle between 0° and 180° with respect to one another, the apparatus comprising:

a shaft fixed in space with respect to the conveying lines;

a rotating body rotatively mounted on the shaft;

drive means usable for causing the rotating body to rotate on the shaft;

pivot means rotatively fixed to the rotating body;

a conveying arm pivoted with respect to the rotating body for picking up articles on one of the conveyers and transferring them to the other of the conveyers;

support means connected to the rotating body for pivotally supporting the conveying arm with respect to the rotating body;

a planetary gear train interposed between the shaft and the support means, the planetary gear train being driven by relative rotation of the rotating body and the shaft, the planetary gear train being configured to rotate the support means at a speed equal to but in a rotational direction opposite to the rotating body; and

an articulated connection between the pivot means and the conveying arm for causing spatial movement of the conveying arm necessary to transfer the objects from a first of the conveyor lines to a second conveyor line.

4,408,687

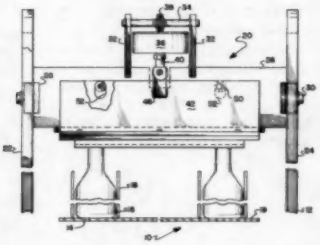
POWER BRAKE FOR ARTICLE FEED APPARATUS

Walter F. Bartsch, Canton, Ohio, assignor to Figgie International, Willoughby, Ohio

Filed Sep. 3, 1981, Ser. No. 298,996

Int. Cl.³ B65G *35/00*

U.S. Cl. 198—491 **6 Claims**



1. In article processing apparatus including a frame and feed conveyor on the frame for supply of a plurality of rows of abutted articles, the improvement comprising

a stop member positioned above said feed conveyor and extending transversely of the rows of abutted articles,

a power device operatively engaging said stop member to move it vertically downwardly to engage the tops of corresponding articles in all of said rows simultaneously to press them downwardly and prevent forward movement thereof whereby feed of articles into the apparatus can be controlled, and

a guide means engages and positions said stop member for slide movement in a vertical plane, and a connector means connects said power device operatively to said stop member to provide limited rotation of said stop member in a vertical plane to compensate for irregularity in engagement of said stop member with a transversely extending row of articles, said vertical plane having said row of articles included therein.

4,408,688

DEVICE FOR COATING A SURFACE OF A CONVEYOR BAND

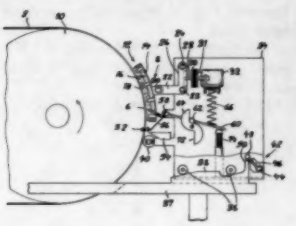
Rudolf Bieri, Winterthur, Switzerland, assignor to Rud. Bier Maschinen Und Apparatebau AG, Effretikon, Switzerland

Filed Nov. 12, 1981, Ser. No. 320,686

Claims priority, application Switzerland, Nov. 14, 1980, 8461/80

Int. Cl.³ B65G *45/02*

U.S. Cl. 198—500 **11 Claims**



1. An apparatus for coating a surface of an endless conveyor band, comprising:

support means juxtaposable with a deflecting roller hugged by a rising bight portion of a conveyor band to be coated;

applicator means on said support means including a plurality of daubers adapted to deposit coating material upon said bight portion at mutually isolated locations spaced apart in axial direction of said deflecting roller; and

distributing means on said support means including a holder, a plurality of wipers on said holder spaced apart in said axial direction, a horizontal guide structure on said support means engaged by said holder, and drive means on said support means coupled with said holder for reciprocating said holder along said guide structure with resulting displacement of said wipers across a zone of said bight portion lying above said locations.

4,408,689

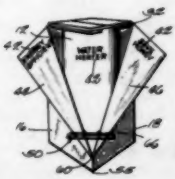
FLOOR MERCHANDISE DISPLAY CONTAINER

Joseph C. Daniels, Kingston Springs, Tenn., assignor to State Industries, Inc., Ashland City, Tenn.

Filed Mar. 11, 1982, Ser. No. 357,280

Int. Cl.³ B65D *5/50*

U.S. Cl. 206—45.17 **6 Claims**



1. A package for containing, shipping and exhibiting floor display merchandise, comprising:

a plurality of adjoining side panels with ends and interior surfaces,

a plurality of end flaps on said ends of said panels,

indicating means which indicate to cut two to said panels across their width near one end of said panels and then along said two panels adjoining edge to near the other end of said panels in order to permit said two panels to be bent so a

portion of said interior surfaces of said panels can be viewed, and

diagonally extending bending means across the width of said two panels which intersect at said panels adjoining edge so that when said two panels are cut they can be bent along said bending means without damaging the structural integrity of said two panels.

4,408,690

BEVERAGE CONTAINER PIERCEABLE BY A DRINKING STRAW

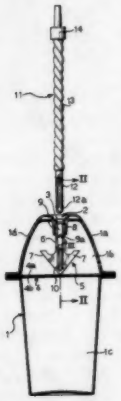
Giovanni Ferrero, Pino Torinese, Italy, assignor to Ferrero S.p.A., Alba, Italy

Filed Jun. 10, 1982, Ser. No. 387,251

Claims priority, application Italy, Jun. 12, 1981, 67815 A/81; Jan. 4, 1982, 67001 A/82

Int. Cl.³ B65D *25/08, 51/22;* **B01F** *7/16*

U.S. Cl. 206—222 **11 Claims**



1. A container for beverages, comprising a body having an upper end wall at least part of which is pierceable by a drinking straw, wherein the improvements consist in:

the body of the container having a frangible internal diaphragm which sub-divides the container into two superimposed chambers, one for containing a beverage and the other for containing an additive substance;

a cutting tool being mounted in the body of the container above the diaphragm, the cutting tool having at least one cutting edge facing the diaphragm and being engageable by an end of the straw, in the first stage of the introduction of the straw into the body of the container, to cause piercing of the diaphragm due to the tool being driven by the straw, and

the pierceable part of the container being provided with a nut of large pitch and the straw having a threaded portion with threading corresponding to the threading of the nut, whereby, after its engagement by the end of the straw, the cutting tool is rotated due to the axial sliding of the threaded portion of the straw in the nut, promoting the mixing of the beverage and the additive substance.

4,408,691

NEEDLE HOLDER

Masamitsu Takahashi, Hiroshima, Japan, assignor to Bankoku Needle Manufacturing Co., Ltd., Hiroshima, Japan

Filed Jun. 15, 1982, Ser. No. 388,523

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—382 **7 Claims**

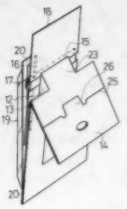
1. A package for elongated articles comprising:

(a) a base member having:

(i) a centrally located U-shaped cut defining a tongue-shaped member;

(ii) a pair of fold lines perpendicular to the longitudinal axis of the package and extending from said U-shaped cut to the longitudinal edges of the package; and

(iii) a fold line in said tongue-shaped member parallel to said first fold lines and dividing said tongue-shaped member into distal and fixed portions;



(b) retaining means for said elongated articles attached to said distal portion of said tongue-shaped member; and

(c) a cover member for covering the elongated articles secured to one end of said base member;

whereby bending of said package along said pair of fold lines causes said distal end of said tongue-shaped member and said elongated articles to slide between said base member and said cover member to a position where the elongated articles will protrude beyond said cover member.

4,408,692

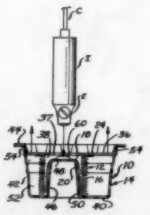
STERILE COVER FOR INSTRUMENT

Bernard Sigel, Winnetka; Carolyn M. Semrow, Island Lake; Mark W. Kolstedt, Cary, all of Ill.; Edward J. Arkans, Sunland, Calif., and Lynn M. Kaczmarek, Park Ridge, Ill., assignors to The Kendall Company, Boston, Mass.

Filed Apr. 12, 1982, Ser. No. 367,527

Int. Cl.³ B65D *85/16, 83/00;* **A61I** *17/02*

U.S. Cl. 206—438 **11 Claims**



1. A sterile cover for an instrument, comprising:

a tray having an upright annular post, with the post having an upper end and a lower end; and

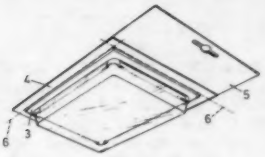
a sleeve of flexible material having an open end and a closed end, said sleeve being placed on the post with the closed end being located adjacent the upper end of the post, with said sleeve extending over the post around the post from the upper end toward the lower end of the post, and with the open end of the sleeve being located adjacent the upper end of the post and being accessible to a user to remove the sleeve from the post.

4,408,693

BLISTER PACK

Luc Brewaeys, and Maurice Hens, both of Wilrijk, Belgium, assignors to CMP Chemical & Metallurgical Products Ltd., Switzerland

Filed Sep. 9, 1981, Ser. No. 300,504
Claims priority, application Belgium, Sep. 19, 1980, 202157
Int. Cl.³ B65D 5/64, 43/00
U.S. Cl. 206—461 3 Claims



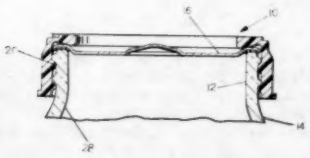
1. A blister pack container comprising, a box-shaped holder and a corresponding cover for said holder, said holder comprising a lower inner rim and an upper outer rim with a step being defined between said inner and outer rims, said cover including a support and a downwardly projecting underlying rim which inserts into said inner rim of said holder when said cover is inserted into said holder, said cover underlying rim and said lower inner and upper outer holder rims extending substantially fully around the peripheries of said cover and holder respectively, and said holder being initially attached to said cover by securing said upper outer rim of said holder to said support, and said cover being removable from said holder by cutting through the blister pack through said upper outer rim around said step to remove the outer rim and the support to which it is attached, leaving said holder with its inner rim and the step and said cover with its downwardly projecting underlying rim on top of said inner rim to form a reusable and reopenable container.

4,408,694

REINFORCED PLASTIC HOME CANNING RING

Bruce Mueller, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 28, 1981, Ser. No. 267,965
Int. Cl.³ B65D 45/30
U.S. Cl. 215—276 2 Claims



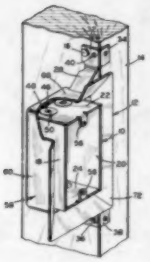
1. A plastic device for securing a lid to a mouth defining portion of a threaded glass container, said device defining an annulus molded of polypropylene material having glass reinforcing fibers disposed therein, said annulus having an inner surface, thread means defined on said inner surface for engaging the threaded portion of said container, and an outer surface, said annulus defining a reference circle disposed therein medially between said inner and outer surfaces thereof, and said reinforcing fibers disposed in generally aligned, overlapped relationship along axes generally parallel to said reference circle of said annulus in two diametrically opposed substantially semicircular regions and said fibers being in random orientation in two diametrically opposed regions between said semicircular regions, said glass fibers having a diameter in the range of 12 to 14 microns and average in length between about 0.075 and 0.300 inches, said fibers, constituting about 30% by weight of said device, the outer surface of said annulus being provided with a plurality of spaced-apart axial flutes.

4,408,695

AIR AND MOISTURE RESISTANT COVER WITH ELECTRICAL BOX HAVING FASTENING FLANGE

G. Russell Balkwill, 2429 Howard Ave., Windsor, Ontario, Canada N8X 3Y5; Jules P. Robinet, 2865 Virginia Park, Windsor, Ontario, Canada N9E 2B8, and John F. Tamasovics, 2530 Todd La., Windsor, Ontario, Canada N9H 1K5

Continuation-in-part of Ser. No. 176,571, Aug. 4, 1980, Pat. No. 4,345,693, which is a continuation of Ser. No. 36,436, May 7, 1979, abandoned, which is a continuation of Ser. No. 908,223, May 22, 1978, Pat. No. 4,158,420. This application Mar. 26, 1982, Ser. No. 362,144
Int. Cl.³ H02G 3/08
U.S. Cl. 220—3.3 11 Claims



1. In combination, a rigid electrical box having an open face, side walls, and a back wall oposite the open face, at least one fastening flange affixed to the box and extending outwardly from one of said side walls and back wall thereof for fastening said box to a structural member, a cover of flexible plastic material of the same general shape as said box extending around and enclosing all of said side walls and said back wall of said outlet box with the open face of said box remaining uncovered, to form an air and vapor barrier around said side walls and said back wall of said box, said cover having wall portions which are contiguous with and affixed to corresponding wall portions of said electrical box, and said cover having two other, opposite wall portions which are spaced from opposite side walls of said box, said cover having a flexible, thin-wall flange around the perimeter extending outwardly therefrom and slanting toward the open face of said box, whereby the peripheral edge of said thin-wall flange can tightly contact the back surface of a wall or the like around the open face of said box and on the same side of the wall or the like as said box, said fastening flange extending through said cover behind said thin-wall flange and sealed with respect to said cover to maintain the air and vapor barrier around said box.

4,408,696

REMOVABLE ELECTRICAL RECEPTACLE

William J. Crosson, Greensburg, Pa., assignor to Westmoreland Plastics Company, Latrobe, Pa.

Filed May 7, 1981, Ser. No. 261,492
Int. Cl.³ H02G 3/12
U.S. Cl. 220—3.6 2 Claims

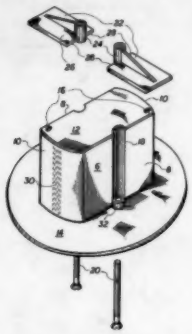
1. A removable receptacle for electrical apparatus, said receptacle comprising:

a receptacle body having a side wall and an end wall and having a removable cover on one end and a peripheral, external flange on the opposite end, said body having at least one channel in said side wall along the outer surface

thereof between said removable cover and said peripheral, external flange;

fastening means having threads on one end and a head on the opposite end, said fastening means extending through an aperture in said peripheral, external flange such that the threaded portion of said fastening means is maintained substantially parallel adjacent to the channel in the side wall of said receptacle body;

a sleeve member provided in juxtaposition to the aperture of sufficiently large diameter to allow the threaded portion of said fastening means to pass, but of small enough diameter to maintain said fastening means substantially orthogonal with respect to said peripheral, external flange; and



at least one clamp threadingly connected to said fastening means, said clamp having a guide portion defining a sleeve that has a surface complimentary to and maintained within the channel such that said guide portion guides said clamp axially of said channel, said clamp further including a retainer portion,

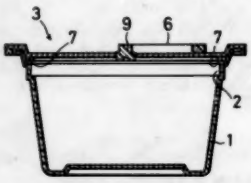
said retainer portion including edge portions extending laterally from opposing sides of said sleeve to act as stops that cooperate with the surface of the side wall of said receptacle body adjacent and outside said channel to prevent said clamp from rotating when said fastening means is turned.

4,408,697

OPENING MEANS HAVING CUTTING GUIDE

Tsukasa Yoshikawa, Inagi, and Masuo Kitamura, Ohmiya, both of Japan, assignors to Tokan Kogyo Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,438
Claims priority, application Japan, Jun. 20, 1981, 56-95609
Int. Cl.³ B65D *17/46*
U.S. Cl. 220—279 **9 Claims**



1. A container for holding an article, comprising:

(a) a container main body;

(b) a lid covering an opening of said container main body, said lid having a laminate structure of at least two kinds of materials, a first material being exposed upon an outer surface of said lid, and a second material being exposed upon an inner surface of said lid; and

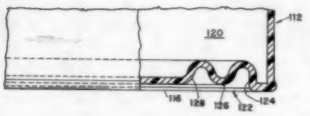
(c) cutting means for cutting at least part of said lid so as to form a cutting region, said cutting means comprising a pull-tab arranged on the outer surface of said lid, a cutting guide arranged on the inner surface of said lid along at least an outer periphery of said cutting region, and a connecting portion extending through a small hole formed in said lid so as to connect said pull-tab with said cutting guide, and said cutting means comprising molded bodies of a synthetic resin which can not be bonded to said first material and which can be bonded to said second material upon molding process thereof on said lid.

4,408,698

NOVEL COVER AND CONTAINER ASSEMBLY

Jose F. Ballester, GPO Box 4523, San Juan, P.R. 00936

Continuation-in-part of Ser. No. 209,823, Nov. 24, 1980, Pat. No. 4,334,631, and Ser. No. 272,307, Jun. 10, 1981. This application Jun. 10, 1982, Ser. No. 387,034
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **13 Claims**



1. A cover and container assembly comprising:

(a) a container portion having a bottom wall, a side wall extending therefrom, and an interlocking assembly projecting upwardly from a terminus thereof, said interlocking assembly being formed of a neck portion and a locking member; and

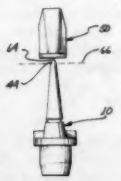
(b) a cover portion having a top wall terminating in a peripherally disposed interlocking assembly and an annular bellows-like portion of at least two grooves separated by a ridge, said interlocking assembly being formed with a locking slot of a conforming shape to said locking member of said container portion cooperatively engageable with said locking member to form a seal.

4,408,699

DISPENSING TIP FOR CYANOACRYLATE ADHESIVES

Hugh J. Stock, Saratoga, Calif., assignor to Pacer Technology and Resources, Inc., Campbell, Calif.

Continuation of Ser. No. 119,452, Feb. 7, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,116
Int. Cl.³ B01L *3/00*; B65D *1/08, 17/24*
U.S. Cl. 222—149 **1 Claim**



1. A dispensing tip attachable to the mouth of a container of

cyanoacrylate adhesive for dispensing the cyanoacrylate adhesive, said dispensing tip comprising in combination:

(a) a disk section supporting an hollow boss for sealingly and internally engaging the mouth of the container;

(b) a conical tip extending from said disk section for dispensing the cyanoacrylate adhesive;

(c) a diametrically oriented ridge extending from said disk section and from opposed sides of said conical tip for providing a gripping surface upon installation of said conical tip within the mouth of the container;

(d) a constant diameter passageway extending through said conical tip from said hollow boss and terminating at a discharge outlet to provide fluid communication between the interior of the container and the discharge outlet; and

(e) a stopper detachably attached to the end of said conical tip for hermetically sealing said passageway prior to detachment of said stopper from said conical tip, said stopper including: a disk extending radially at the extremity of said conical tip, an inverted conical shroud extending from the center of said disk, said conical shroud including a cavity having an interior conical surface for receiving said conical tip and a plug enclosed within said cavity for engaging said passageway on mounting of said stopper upon said conical tip to force flow of any residual cyanoacrylate adhesive within said passageway into the container, and a pair of flanges disposed upon opposed sides of said shroud and joined to said disk for providing an enlarged surface area to grip said stopper and which grip is restrained from sliding by said disk.

4,408,700

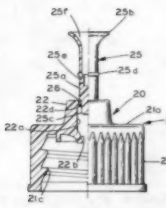
MULTI-PART DISPENSING CLOSURE HAVING A FRANGIBLE CONNECTING WEB

William E. Fillmore; George V. Mumford, both of Toledo, and Ned J. Smalley, Perrysburg, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 28, 1981, Ser. No. 267,958

Int. Cl.³ B65D *47/26, 47/36*

U.S. Cl. 222—153 **4 Claims**



1. A unitary molded article of elastomeric material for forming a dispensing closure for a container neck, said article comprising a cap-shaped portion having a panel and a depending annular skirt constructed and arranged to snugly engage a container neck, said cap-shaped portion defining a vertical sleeve having a valve receiving opening, a hollow valve portion coaxially disposed relative to said skirt portion but axially upwardly spaced from said opening, said hollow valve portion initially comprising integrally molded components including a transverse cylindrical base portion snugly insertable in said vertical sleeve and having an upstanding plug and vertical dispensing openings below said plug; and a cup shaped portion having an open top bore, a vertical opening in its bottom portion adapted for sealing engagement with said plug and a severable web portion initially connecting said cap portion to said plug to maintain said cap portion in axially spaced relationship to said base portion, and a severable web portion joining said sleeve and said base portion, adapted to shear when a predetermined axial downward force is applied to said hollow valve portion thereby causing said hollow valve portion to move axially downwardly into said valve receiving opening to close said valve receiving opening in said cap portion, said hollow valve portion being vertically slidable in said sleeve when said web means is severed, said cup portion thereof having an external surface snugly engageable with the interior wall of said vertical sleeve, and retaining means on said sleeve engageable with said external surface of the cup shaped portion to resiliently retain the latter within said sleeve, whereby vertical movement of said cup shaped portion after severing thereof from said plug portion to a position above said plug portion permits product dispensing flow through said closure.

4,408,701

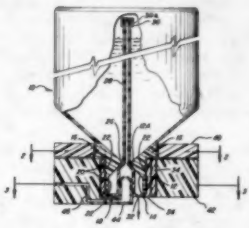
LIQUID DISPENSING VALVE

Edward L. Jeans, Ledbury, England, assignor to Cadbury Schweppes PLC, London, England

Continuation-in-part of Ser. No. 140,698, Apr. 16, 1980, abandoned. This application Oct. 9, 1981, Ser. No. 310,487

Int. Cl.³ B67D *5/56*

U.S. Cl. 222 **14 Claims**



1. A dispensing valve for dispensing concentrate and diluent to make a beverage comprising:

(a) a first member containing therein a cylindrical bore having a first pressurizing gas passage terminating at an elongated outlet in said bore, and a first diluent passage terminating in a further outlet in said bore, the bottom of said bore containing an open area through which concentrate can be dispensed;

(b) seals surrounding said elongated outlet and said further outlet;

(c) a central, rotatable valve member of generally annular shape disposed for rotation within said cylindrical bore, a peripheral portion thereof sealing against said seals, said rotatable valve member having a diluent outlet;

(d) means within the annulus of said rotatable valve member for supplying pressurizing gas to a container;

(e) a second pressurizing gas passage extending through said rotatable valve member from said peripheral portion to said means within the annulus, the inlet of said second gas passage adapted to be brought into alignment with said elongated outlet over a range of rotation of said rotatable valve member;

(f) a second diluent passage and expansion chamber within said rotatable valve member for coupling said further outlet with said diluent outlet when said rotatable valve member is rotated to a pre-determined position within said range of rotation;

(g) means in said rotatable valve member for engaging a first container part;

(h) means for retaining said rotatable valve member in place;

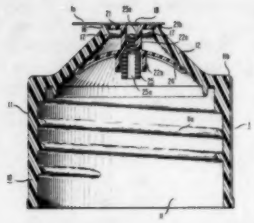
(i) means fixed with respect to said first member for engaging a second container part; and

(j) means to rotate said rotatable valve member.

4,408,702
AUTOMATIC DISPENSER CAP

William Horvath, 10 Crestwood Dr., Watchung, N.J. 07060

Filed Nov. 6, 1981, Ser. No. 318,835
Int. Cl.[3] B05B *11/04*
U.S. Cl. 222—212 27 Claims



1. A cap, for dispensing product contained in a squeeze container having a mouth at one end, comprising in combination:

a hollow body portion with a circular section substantially symmetrical about a central axis, having at one end an enlarged opening including means for connecting said body portion in liquid-tight relation to the mouth of said container, and having at its other end a frustoconical outwardly-projecting spout tapering from a larger internal diameter to a smaller outer spout opening symmetrically disposed about said axis;

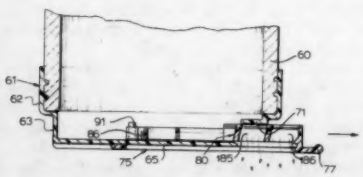
a valve-head comprising a disc for seating in liquid-tight relation against the outer edge of said smaller spout opening, a stem with one end centered on the inner face of said disc and projecting into said frustoconical spout along said central axis, a plurality of resilient flexible members fixed to and extending radially outward from the surface of said stem adjacent its inner end, the outer ends of said flexible members being curved in outwardly-directed convex relation to the principal axis of said hollow body portion, and with their ends bearing against the inner surface of said frustoconical spout in tangential relation thereto;

wherein said valve-head disc is responsive to squeeze pressure exerted on said container to unseat from said spout opening, and wherein said plurality of resilient members is constructed and arranged to provide spring bias between said valve-head and the inner surface of said frustoconical spout which operates to reseat said valve-head disc on said spout opening upon release of said squeeze pressure.

4,408,703
DISPENSER COFFEE CAP

Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022

Filed May 13, 1981, Ser. No. 263,144
Int. Cl.[3] G01F *11/18, 11/26*
U.S. Cl. 222—284 28 Claims

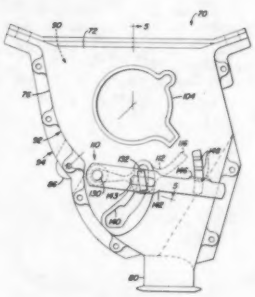


1. Apparatus for dispensing a predetermined amount of material from a container comprising a cap attachable to said container and having a top portion, said top portion comprising housing wall means, for defining a collection space communicating with the interior of said container and a laterally facing discharge opening leading from said collection space, and a planar ledge portion between an outer edge of said top portion and a bottom edge of said discharge opening, and a slide element comprising a generally planar top wall having an opening formed intermediately thereof and carrying underneath a chute element and a biasing means, said chute element comprising a series of longitudinally spaced lateral wall surfaces defining therebetween a corresponding series of vertically open trap chambers facing said top wall opening therebeneath across a gap, said biasing means comprising a resilient member which is compressed during outward movement of said slide element for providing a return force upon said slide element, said slide element top wall lying on said housing wall means for slidable movement thereover such that said chute element trap chambers pass into and out of said discharge opening and a portion of said housing wall means fits into said gap, whereby said trap chambers are contained in said collection space when said slide element is in its closed position and pass over said ledge portion during outward movement of said slide element.

4,408,704
FEED CUP ASSEMBLY WITH FLEXIBLE METERING GATE

Ronald M. Steilen, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 3, 1981, Ser. No. 289,629
Int. Cl.[3] B65D *88/54*
U.S. Cl. 222—312 10 Claims



1. In an implement seed metering device including first and second opposed sidewalls and a metering roll supported between the sidewalls adjacent the first sidewall and rotatable about an axis generally transverse to the sidewall, said roll terminating inwardly of the second sidewall, an improved feed gate assembly comprising:

a resilient feed gate extending adjacent the metering roll between the sidewalls, said gate having a first end connected for pivoting about an axis parallel to the rotational axis and a second end opposite the first, said ends spaced by first and second side members extending generally along the first and second sidewalls, respectively, said first side member movable adjacent the first sidewall generally about the axis parallel to the rotational axis whereby said gate contains seeds adjacent the metering roll between the sidewalls, and means for pivoting the feed gate about the pivotal axis to adjust the position of the gate relative to the roll including a lever selectively positionable adjacent the second sidewall and means extending through the second sidewall for connecting the lever to the second side member between the pivotal connection and the second end to restrict the movement thereof relative to the metering roll and the first side member, wherein the first side member is

substantially free to flex between the pivotal axis and the second end.

4,408,705

CYCLE CARRIER

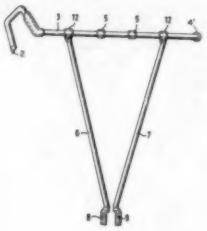
Heinz Niemann, Herford, Fed. Rep. of Germany, assignor to Esge-Marby GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,684

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110870

Int. Cl.³ B62J *7/04;* **F16B** *7/00*

U.S. Cl. 224—39 **19 Claims**



1. Cycle carrier having

an essentially rectangular frame **(1)** including longitudinal frame elements **(3)** and cross elements **(4)**;

support struts **(6, 7)** to support the frame from an axle amount of the cycle, said support struts **(6, 7)** extending in parallel planes essentially transverse to the plane defined by the rectangular frame;

and means attaching the support struts to the frame

comprising in accordance with the invention

a plastic element **(12)** having a first portion **(13)** molded in place in surrounding relation to the longitudinal frame element **(3)** and having an integral projecting portion **(15)** extending at right angles with respect to the longitudinal frame element,

the projecting portion being formed with an opening **(17** therein) dimensioned to receive a bent-over portion **(10, 11)** of the support strut **(6, 7)**, which is bent-over at right angles with respect to the major extend of the support struts;

an insertion slit **(18)** extending from the opening to the outer circumference of the projecting portion;

and means including a holding ring **(19)** surrounding the bent-over portion and adapted to be slid over the projecting portion in the region of the opening for closing off the insertion slit and retained on said projecting portion for holding the bent-over portion of the support strut in position on the frame.

4,408,706

HOLSTER FOR LABELER

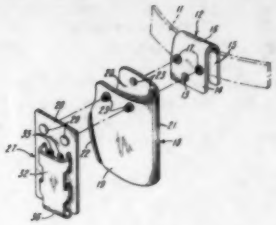
Thomas M. Hurley, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 16, 1979, Ser. No. 67,242

Int. Cl.³ F41C *33/02*

U.S. Cl. 224—192 **13 Claims**

1. A holster adapted to hold a gun-like labeler, comprising: a generally U-shaped holder adapted to fit over a belt of a user, a snap fastener for connecting opposed legs of the holder, one leg of the holder having a first snap fastener portion, a first holster member comprised of a one-piece panel having end portions connected by a lap joint and opposed side portions, each side portion having a second snap fastener portion so that either side of the first holster member can be detachably connected to the holder, a second generally U-shaped holster member adapted to carry a roll of labels, the second holster member comprised of a one-piece panel having opposed sides and overlapped, connected, end tabs, one side of the second



holster member having a first snap fastener portion for connection of the remaining second snap fastener portion on the first holster member.

4,408,707

REVOLVER RELOADER HOLSTER

William H. Rogers, Jacksonville, Fla., assignor to Rogers Holster Co., Inc., Jacksonville, Fla.

Filed Oct. 13, 1981, Ser. No. 310,796

Int. Cl.³ F42B *39/04, 39/00*

U.S. Cl. 224—239 **12 Claims**

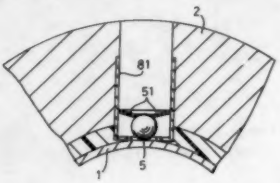
1. A holster for a cartridge reloader for a revolver, the reloader being of the type having a plurality of chambers for holding cartridges with the chambers being disposed on both sides of a longitudinal plane passing through the longitudinal axis of the reloader and the chambers being substantially parallel to the longitudinal axis, said holster comprising a body having a front, a back, a top, a bottom, two sides, and a flap extending downwardly from said top and overlapping said front, and fastening means for releasably attaching said top to said front; said holster having an interior cavity adapted to fit closely around the reloader when positioned with the base of the cartridges adjacent said top and the bullets of the cartridges adjacent said bottom, said sides of said holster having opening means open sufficiently to permit a belt to be threaded therethrough below said reloader and to permit grasping of the reloader while unfastening said fastening means, said opening means and said cavity being related so that said belt separates generally half of said cartridges of said reloader on either side of said belt to provide enhanced unobtrusiveness of said reloader and holster when worn.

4,408,708

METHOD OF SECURING PREFABRICATED LAGGING COMPONENTS TO A METAL SURFACE, AND A PREFABRICATED LAGGING COMPONENT FOR USE IN THE METHOD

Leon J. E. Delcour, Liege, Belgium, assignor to Cockerill Sambre, Seraing, Belgium

Filed Apr. 9, 1981, Ser. No. 252,290
Claims priority, application Belgium, Apr. 11, 1980, 200196
Int. Cl.³ B23K 31/00
U.S. Cl. 228—139 3 Claims



1. A method of securing a lagging component to a metal surface, comprising: positioning a prefabricated lagging component on the metal surface, said lagging component having one or more holes lined with a hollow sleeve having a base formed with an aperture, each hollow sleeve containing a securing element held by a cardboard washer having an aperture revealing part of the surface of the corresponding securing component; welding the securing element to the surface using a welding gun; and filling the remaining hole cavity with a packing material around the securing element.

4,408,709

METHOD OF MAKING TITANIUM-STABILIZED FERRITIC STAINLESS STEEL FOR PREHEATER AND REHEATER EQUIPMENT APPLICATIONS

Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 244,379, Mar. 16, 1981, Pat. No. 4,374,666, which is a continuation-in-part of Ser. No. 234,213, Feb. 13, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,113
Int. Cl.³ B23K 31/06; C22C 38/28
U.S. Cl. 228—183 1 Claim

1. In the method for making moisture separator reheater and feedwater preheater apparatus for the exchange of heat in which a plurality of thin-walled metal members are formed, welded, finned and affixed to tube sheets in an array with gaps between said members the improvement of using as a metal for the walls of said members a titanium-stabilized and corrosion resistant ferritic stainless steel resistant to sensitization during long-term operation at intermediate temperatures in said apparatus for the exchange of heat and consisting essentially of, in weight percent:

Carbon	= 0.025% max
Nitrogen	= 0.025% max
Carbon + Nitrogen	= 0.045% max
$\left(\frac{\text{Titanium}}{\text{Carbon}}\right)$	≧ 45
Silicon	= 1.0% max
Manganese	= 1.0% max
Phosphorous	= 0.04% max
Sulfur	= 0.03% max
Chromium	= 18–20%
Molybdenum	= 1.75–2.25%

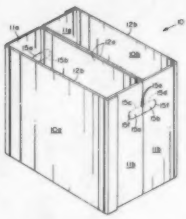
the balance being iron and incidental impurities.

4,408,710

CARTON HAVING TEAR RESISTANT HAND HOLES

John J. Aust, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 12, 1981, Ser. No. 273,131
Int. Cl.³ B65D 5/46, 5/48, 25/28
U.S. Cl. 229—15 2 Claims



1. In a rectangular box including two opposed end walls, two opposed side walls extending between opposite ends of said end walls and a divider wall extending between said side walls, thereby dividing the interior of the box into two compartments, the improvement wherein:

(a) said divider wall and side walls comprise a pair of U-shaped vertically disposed corrugated panels each having a central portion and arm portions, integral with said central portion, extending from opposite ends of said central portion, the central portions of said pair of U-shaped panels abutting to form said divider wall and said arm portions extending at right angles in opposite directions from the respective of said central portions and joined to the respective opposite ends of said end walls, the pair of arm portions at each end of said divider wall forming the respective of said side walls; and

(b) each of said pair of arm portions, forming an end wall, having a pair of contiguous finger insertion openings, one of said openings being in each arm portion immediately adjacent to the respective central portion, said finger insertion openings being aligned and each limited in size to permit insertion of only two adult fingers therein, each said opening being formed with a fillet of a substantial radius provided at the upper corner of each opening adjacent the respective central portion, said fillet bridging said arm portion and said central portion, and said central portion extending from said fillet at a right angle to reinforce said fillet and said finger insertion opening against tearing.

4,408,711

THERMOSTAT WITH ADAPTIVE OPERATING CYCLE

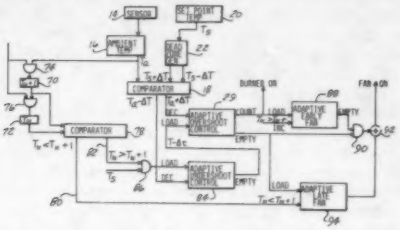
Michael R. Levine, 2900 Heatherway, Ann Arbor, Mich. 48104

Division of Ser. No. 206,761, Nov. 24, 1980, Pat. No. 4,356,962. This application Jul. 26, 1982, Ser. No. 401,787
Int. Cl.³ F24D 5/10; G05D 23/32
U.S. Cl. 236—11 5 Claims

1. In a thermostat for controlling a temperature modifying apparatus of the fluid transfer type, the temperature modifying apparatus having means for modifying the temperature of the fluid and means for circulating the fluid, the thermostat having connections to the temperature modifying apparatus for separately controlling the temperature modifying apparatus and the fluid circulating apparatus, and the thermostat having

means for generating electrical signals representative of its ambient temperature, the improvement comprising:

means for adaptively modifying the time delay between the initiation of a control signal for energizing the thermal modifying apparatus and the subsequent generation of a control



signal energizing the fluid circulating apparatus, comprising means for storing a delay signal and means for adaptively modifying the period of the delay signal as a function of the direction of change of the signal representative of ambient temperature at the thermostat following initiation of the energizing signal for the fluid circulating apparatus.

4,408,712

APPARATUS FOR CONTROLLING AIR CONDITIONERS FOR AUTOMOBILES

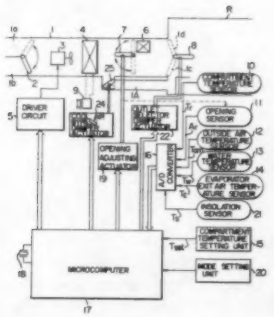
Masanori Naganoma, Kariya; Kazuaki Takemoto, Anjo, and Mitsutoshi Moriya, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 8, 1982, Ser. No. 386,266

Claims priority, application Japan, Jun. 11, 1981, 56-90625

Int. Cl.³ G05D *23/00*; B60H *3/00*

U.S. Cl. 236—13 **4 Claims**



1. An apparatus for controlling an air conditioner for an automobile comprising:

an air conditioning unit including an air duct, a heater unit having means for heating air passing through said air duct and means for adjusting the amount of air passing said heater unit, an air distributing unit for switching among a plurality of positions of air supply outlets into a compartment of said automobile, said outlets including a ventilation supply outlet, and an air bypass containing an air valve therewithin for supplying cool air upstream of said heater unit to said ventilation supply outlet;

a compartment temperature setting unit for setting a desired value for temperature within said compartment;

sensing units for sensing the temperature within said compartment and the amount of insolation into said compartment, respectively;

a processing unit responsive to output signals from said compartment temperature setting unit and said sensing units for computing a desired temperature of supply air into said compartment, determining the positions of the air supply outlets of said air distributing unit in accordance with the desired supply air temperature, deciding whether the desired supply air temperature is lower than a first preset value and whether the sensed insolation amount is less than a second preset value, and producing output signals indicative of the results of the determination and decisions; and

actuator means for actuating said air distributing unit and said air valve disposed within said air bypass in response to the output signals of said processing unit,

whereby the temperature within said compartment is maintained at the desired value and the supply of cool air through said air bypass is controlled in response to the insolation amount.

4,408,713

CONTROL FOR AUTOMOBILE AIR CONDITIONING SYSTEM

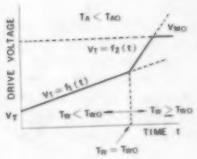
Tetsuya Iijima, Yamato, and Seiichi Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 3, 1981, Ser. No. 317,863

Claims priority, application Japan, Nov. 4, 1980, 55-153721

Int. Cl.³ F24F *7/00*; G05D *23/00*

U.S. Cl. 236—49 **20 Claims**



1. An air quantity control method for an automobile air conditioning system including a blower fan, and a heat source, comprising the steps of:

(a) monitoring an ambient temperature condition of the automobile to detect a predetermined ambient temperature condition;

(b) sensing the temperature of said heat source; and

(c) setting operation of the blower fan speed in accordance with a timed mode when said predetermined ambient condition is detected, said setting step including the further steps of

(d) controlling the blower fan speed in accordance with a first mode of operation in which the blower fan speed is gradually increased with time when said sensed temperature is lower than a predetermined reference level, and

(e) controlling the blower fan speed in accordance with a second mode of operation in which the blower fan speed is more rapidly increased than that in the first mode of operation when said sensed temperature is higher than said predetermined reference level or when said ambient temperature condition is other than said predetermined ambient temperature condition.

4,408,714

HEATING APPARATUS FOR MOTOR VEHICLES

Shigeru Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Feb. 18, 1982, Ser. No. 349,843

Claims priority, application Japan, Feb. 27, 1981, 56-26998

Int. Cl.³ B60H *1/02*

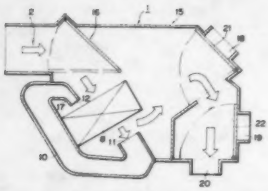
U.S. Cl. 237—12.3 C **5 Claims**

1. A heating apparatus for motor vehicles, comprising:

an air flow passage provided with a first and second port

which are adapted for taking in air from the vehicle compartment and for taking in air from outside the motor vehicle, respectively;

an air intake door provided in said air flow passage in proximity to said first and second ports, said air intake door being arranged to selectively assume a first position to close said first port and open said second port for permitting the air taken in from outside the motor vehicles to be introduced into said air flow passage, a second position to open said first port and close said second port for permitting the air taken in from the vehicle compartment to be introduced into said air flow passage, and any intermediate position to open both of said first and second ports for permitting a mixture of the air taken in from outside the motor vehicle and the air taken in from the vehicle compartment to be introduced into said air flow passage;



a heater core disposed in said air flow passage;

a blower disposed in said air flow passage; and

a heated air recirculation passage communicating with said air flow passage at a position upstream of said heater core and at a position downstream thereof, so that part of an air flow passed through and heated by said heater core to be used for heating the vehicle compartment is passed through said recirculation passage to be recirculated to a region upstream of said heater core.

4,408,715

HEATING INSTALLATION FOR PREMISES FOR DWELLING OR INDUSTRIAL USE

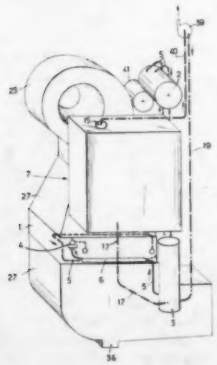
Michel Gueneau, Aurignac, France, assignor to Societe Nationale Elf Aquitaine Tour Aquitane, Courbevoie, France

Filed Mar. 17, 1981, Ser. No. 244,702

Claims priority, application France, Mar. 19, 1980, 80 06103

Int. Cl.³ G05D *23/00*

U.S. Cl. 237—2 B **23 Claims**



1. A heating installation for home or industrial use, comprising:

a boiler enclosure containing an intermediate liquid to be heated;

an internal combustion engine suspended in said boiler and at least partially submerged in said intermediate liquid for operating in said submerged condition so that heat generated by the operation of said engine is transferred directly to said intermediate liquid;

an exhaust pipe means for removing exhaust gases connected to said internal combustion engine and at least partially submerged in said intermediate liquid;

an exhaust heat exchanger located within the boiler enclosure and operatively connected to said exhaust pipe, so that heat from the submerged portions of the exhaust is transferred to the intermediate liquid;

a heat pump having a condenser, an evaporator, and a compressor which is driven by said internal combustion engine, said compressor being the only load of said internal combustion engine, so that at lower temperatures the amount of required compression and resulting load increases, producing therefore a greater thermal dissipation from said internal combustion engine, while heat from said condenser is transferred to said intermediate liquid within the condenser;

heating members located in the premises to be heated and supplied with a heating fluid heated by the intermediate liquid of said boiler; and

said condenser being situated downstream from the heating members and upstream from the boiler so that the heating fluid flowing from said heating members to said boiler is heated during its passage through the condenser.

4,408,716

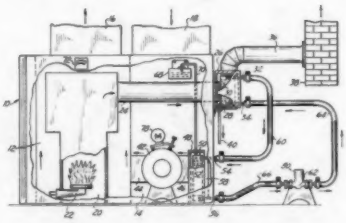
FLUE GAS HEAT RECOVERY SYSTEM

Leon G. Rockwell, 621 N. Lafayette, Dearborn, Mich. 48128

Filed Mar. 1, 1982, Ser. No. 353,407

Int. Cl.³ F24B *7/00*

U.S. Cl. 237—55 **1 Claim**



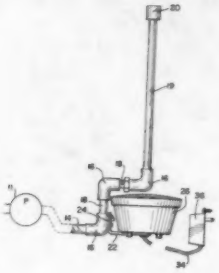
1. A flue gas heat recovery system for a forced hot air furnace having a combustion chamber, a hot air plenum surrounding the combustion chamber, a flue for conducting gases from the combustion chamber to the atmosphere, a cold air chamber in communication with the hot air plenum, an electrically driven blower fan in the cold air chamber for accelerating the flow of air through the furnace, and a thermal device associated with the hot air plenum controlling the blower fan; such system comprising a first heat exchanger in a heat absorbing relationship with the flue gases, a second heat exchanger in the cold air chamber in a heat transferring relationship with the air passing through the blower fan, a hydraulic circuit connecting the two heat exchangers, an electrically driven pump in the hydraulic circuit adapted to be actuated simultaneously with the blower fan for continuously circulating the fluid in such hydraulic circuit while the blower fan is in operation, a reservoir, a fluid conductor providing communication between the reservoir and such hydraulic circuit for maintaining the pressure therein at a constant pre-selected level, a box enclosing the first heat exchanger and drain means associated with the box for removing therefrom condensate.

4,408,717

FOUNTAIN CONSTRUCTION WITH LIGHTING MEANS

Robert W. Rynberk, Hinsdale, Ill., assignor to Valley View Specialties Co., Crestwood, Ill.

Filed Apr. 27, 1981, Ser. No. 257,882
Int. Cl.³ F21P 7/00
U.S. Cl. 239—18 2 Claims



1. In a water fountain construction for creating a spray of water over the surface of a pond or the like including a water feed line, a water feed pipe having an upper end extending at least to the water surface, at least one nozzle mounted on said upper end of said pipe, and a pump for delivering water under pressure through said line and to said pipe whereby the water is forced out of said nozzle to form the water spray, the improvement comprising means for removably mounting a lamp at the juncture of said line and said pipe, said means including elbows and short pipe sections providing the juncture between said line and said pipe, said elbows forming an area adapted to be occupied by said lamp, and including a bracket supporting said lamp in said area, one of said elbows including a first arm connected to said light and a second arm extending at a right angle to said first arm, said second arm having an axis displaced to the side of the axis of said pipe, said bracket being connected to said first arm and including a member extending outwardly to intersect the axis of said pipe, the outermost end of said member including a cut-away section, said lamp being mounted in said cut-away section of said member beneath said pipe for removal from the construction without disconnecting the bracket from the first arm whereby light beams emitted by the lamp are directed substantially axially of said pipe, the spray of water emitted by said nozzle being emitted within said light beam.

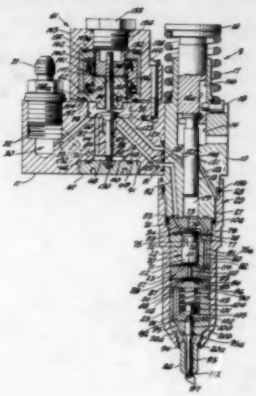
4,408,718

ELECTROMAGNETIC UNIT FUEL INJECTOR

Thomas J. Wich, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1981, Ser. No. 305,501
Int. Cl.³ F02M 47/00
U.S. Cl. 239—88 5 Claims

1. An electromagnetic unit fuel injector including a housing means having fuel passage means for the ingress and egress of fuel at a suitable supply pressure; a pump cylinder means in said housing means; an externally actuated plunger reciprocable in said cylinder means and defining therewith a pump chamber open at one end for discharge of fuel during a pump stroke and for fuel intake during a suction stroke of said plunger; said housing means including a valve body having a spray outlet at one end thereof for the discharge of fuel; an injection valve means movable in said valve body to control flow from said spray outlet; a discharge passage means connecting the said pump chamber to said spray outlet; and, a valve controlled passage means connecting said fuel passage means to said discharge passage means adjacent to said pump chamber; said valve controlled passage means including a solenoid actuated valve means controlling flow communication with said fuel passage means, a stepped servo control valve means and a control pressure passage means interconnecting said solenoid actuated valve means and said servo control valve means; said servo control valve means including a servo control valve controlling flow between said control pressure passage and



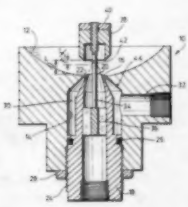
said discharge passage means and a piston operatively connected at one end to said servo control valve and having its other end exposed to the pressure of fuel in said discharge passage means, the effective area of said servo control valve being substantially greater than the effective area of said piston.

4,408,719

SONIC LIQUID ATOMIZER

Anthony J. Last, 191 King St., Oakville, Canada L6J 1B3

Filed Jun. 17, 1981, Ser. No. 274,411
Int. Cl.³ B05B 3/14
U.S. Cl. 239—102 4 Claims



1. A sonic liquid atomizing device comprising:

a body member having a concave face and a bore having a tapered outlet end terminating in an opening centrally located in the face;

a nozzle member mounted in the bore of the body member and having an externally tapered outlet end projecting through the opening in the face of the body member to provide, with the bore, a tapering annular passage circumscribing the nozzle and having converging side walls in the direction of the opening in the face of the body member, the nozzle being adjustable axially to vary the area of the annular aperture;

a stem mounted axially in the nozzle and carrying a resonator spaced from the outlet end of the nozzle and from the concave face of the body member;

inlet means in the body member connecting with the annular passage for the passage of liquid therethrough; and

inlet means in the nozzle connecting with the tapered outlet end for the passage of gas therethrough;

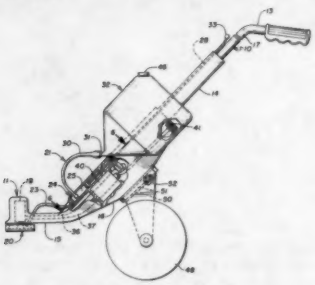
the converging projection of the tapered outlet end of the nozzle terminating on the axis of the stem between the resonator and a point one third of the distance from the resonator to the outlet end of the nozzle.

4,408,720

DEMOUNTABLE WHEELED LIQUID SPRAYER

Donald R. Anderson; Iven R. Norstrud, and John H. Threlkeld, all of Britt, Iowa, assignors to Britt Tech Corporation, Britt, Iowa

Filed Jan. 15, 1981, Ser. No. 225,196
Int. Cl.³ B05B 9/00
U.S. Cl. 239—149 **17 Claims**



1. A demountable wheeled liquid sprayer comprising:

(a) a wheeled frame;

(b) an elongated handle member detachably mounted at its medial portions in inclined supported relation upon said frame for ready detachment therefrom and having its lower end portion angulated and extending generally horizontally from said medial portions;

(c) a powered motor mounted on said lower end portion and detachable therewith and having a vertically extending drive shaft;

(d) an upwardly facing cup member mounted on said drive shaft in depending driven relation for rapid rotation therewith;

(e) a liquid container mounted on the medial portions of said handle member in supported relation and having a liquid outlet;

(f) conduit means connected to said container outlet and conveying liquid therefrom and discharging the same within the confines of said cup; and

(g) said cup member having liquid containing walls through which a plurality of discharge openings extend to cause the liquid received therein to be dispersed in tiny droplets as it is received therewithin and as said cup member is rapidly rotated by said motor;

(h) said handle member, motor, cup member, container, and conduit means being constructed and arranged for ready detachment as a unit from said frame and its wheels for hand-carried operation apart therefrom.

4,408,721

FITTING TO COMBINE AIR AND PRESSURIZED WATER

Carlos Cohen, Toronto, and Alfred Raab, Brampton, both of Canada, assignors to Jacuzzi Inc., Little Rock, Ak.

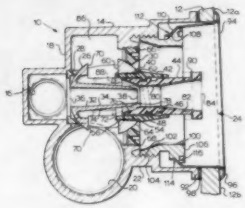
Filed Feb. 23, 1981, Ser. No. 237,532
Int. Cl.³ E03C 1/084; B05B 7/12
U.S. Cl. 239—417 **8 Claims**

1. In a hydro-air fitting assembly for controlling and directing a flow of aerated water including a housing, a hollow ball member pivotable in said housing and having passages therein for directing a flow of water and a flow of air, and a nozzle member co-pivotable with said ball having an axial passage therethrough where said air flow and water flow mix,

a nozzle holder to be received in said ball and having

a central passage therethrough for telescopingly receiving said nozzle,

means formed on said nozzle and said nozzle holder to provide for axial adjustment of said nozzle with respect to said ball between a first open position and a second paritally closed position,



said means comprising a channel of limited duration, which channels's ends terminate inboard of the ends of the member of which it is a part, and

means formed on said nozzle holder and said ball to permanently retain said nozzle holder in a fixed axial position after insertion into said ball,

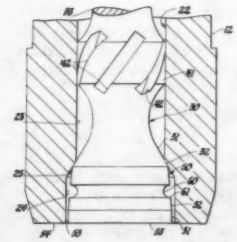
whereby no additional elements are required to secure said nozzle holder in said ball or to limit the axial movement of said nozzle.

4,408,722

FUEL INJECTION NOZZLE WITH GROOVED POPPET VALVE

Arthur R. Frelund, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 29, 1981, Ser. No. 268,366
Int. Cl.³ B05B 1/32
U.S. Cl. 239—453 **2 Claims**



1. In a fuel injection nozzle of the outward opening poppet valve type for a diesel engine, the injection nozzle having a spray tip housing with an axial bore therethrough defining a cylindrical straight walled outlet opening extending a predetermined axial distance from one end thereof to an annular valve seat and a valve member axially movable in the bore, the valve member having an annular seating surface for engagement with the valve seat with a spray control pintle integrally extending therefrom and coacting with the wall of the bore to define a discharge orifice of annulus configuration, the pintle including a straight pintle land portion at its free end and a control cone tapering inwardly from the pintle land to join said seating surface, said pintle land portion having an outside diameter so as to define with said straight walled outlet opening an annular spray discharge orifice; the improvement wherein said valve member further includes a recessed annular

groove located on said pintle cone from said free end a preselected distance greater than the axial extent of travel of said valve member so that during full opening movement of the valve member, said groove will not project outboard of said spray tip housing to thus affect the spray discharge pattern while said groove is operative so as to provide a thermal boundry downstream, in terms of fuel flow through the injector, of the seating surface of the poppet valve and, it is operative to effect turbulence of the fuel being discharged when the poppet valve is in an open position relative to the valve, said groove thus being operative so as to substantially eliminate carbon build-up inside the injector during its operation in an engine.

4,408,723

METHOD OF AND APPARATUS FOR THE TREATMENT OF PYRITE-CONTAINING MINERAL COAL

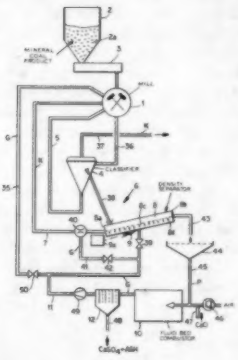
Fritz Adrian, Ratingen; Heinrich Sättler, Treis, and Werner Sauerland, Voerde, all of Fed. Rep. of Germany, assignors to Steag Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 24, 1980, Ser. No. 200,380

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943555

Int. Cl.³ B02C *23/24*

U.S. Cl. 241—19 **2 Claims**



1. A method of treating mineral coal containing pyrite which comprises the steps of:

(a) milling a mineral coal product containing pyrite and mineral detritus in the presence of a gas stream to form a fine component consisting predominantly of coal and a coarse component comprising pyrite, mineral detritus and coal;

(b) classifying the milled product step (a) to separate said fine component from said coarse component;

(c) subjecting said coarse component to a density separation on a vibrating trough while fluidizing same on said trough with a gas stream to produce a light product consisting predominantly of coal and a heavy product in the form of a combustible mixture of pyrite, coal and mineral detritus;

(d) burning said combustible mixture in the presence of lime to produce a gas and an environmentally safe solid residue consisting essentially of gypsum and ash; and

(e) feeding the gas produced in step (d) to at least one of steps (a) and (c) as the respective gas stream thereof.

4,408,724

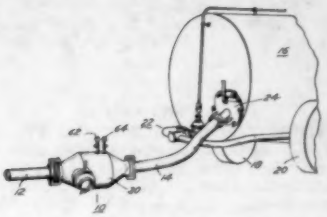
PULVERIZER DEVICE FOR HANDLING LIQUIDS CONTAINING SOLID AND SEMI-SOLID MATERIALS

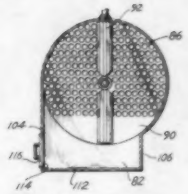
Charles R. Meyer, Rte. 2, North Manchester, Ind. 46962

Continuation-in-part of Ser. No. 255,337, Apr. 17, 1981, abandoned. This application Mar. 11, 1982, Ser. No. 357,253

Int. Cl.³ B02C *23/36*

U.S. Cl. 241—46.17 **15 Claims**





1. A pulverizer device for handling liquids containing solid and semi-solid materials, comprising a housing for receiving untreated liquid and for discharging treated liquid, an inlet port adapted for connection to a liquid supply means, a discharge port adapted for connection to a liquid collection or handling system, a screen in said housing disposed between said ports for trapping solids and semi-solids in the untreated liquid and having a substantially imperforate area near the bottom to facilitate removal of hard solids from said screen means on the intake side thereof, chopping means for pulverizing the solids and semi-solids in the liquid, a sump disposed in said housing beneath said screen for collecting the undisintegrated hard solids in the liquid, and a port means having a closure for removing the collected solids from said sump.

4,408,725

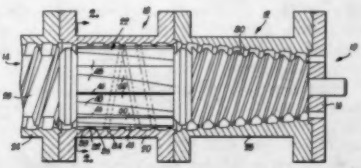
SCREW AND HEAD ASSEMBLY FOR PROCESSING WHOLE GRAINS AND CELLULOSIC MATERIALS

Lavon G. Wenger, and Bobbie W. Hauck, both of Sabetha, Kans., assignors to Wenger Manufacturing, Sabetha, Kans.

Continuation of Ser. No. 210,683, Nov. 26, 1980, abandoned. This application May 17, 1982, Ser. No. 378,994

Int. Cl.³ B02C *7/04*

U.S. Cl. 241—260.1 **11 Claims**



6. In an extruder barrel assembly adapted to receive and convey a material:

a tubular barrel section presenting on the interior thereof at least one relatively sharp cutting edge;

a rotatable screw section disposed within said section and including an elongated body having means on the periphery thereof for pushing said material outwardly against said cutting edge during rotation of the screw section in order to subdivide said material,

said means including structure defining a series of separate, circumferentially spaced, elongated grooves extending generally along the length of the body, said grooves progressively decreasing in depth from one side margin thereof to the other side margin.

4,408,726

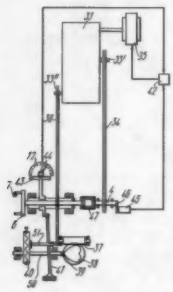
ORTHOCYCLIC COIL WINDING MACHINE

Ivan A. Leonov, Bezbozhny pereulok, 3, kv. 31; Boris V. Smirnov, Chusovskaya ulitsa, 10, korpus 1, kv. 17; Vladimir V. Mashinin, Igralnaya ulitsa, 10, kv. 220, and Viktor I. Sharovatov, ulitsa Burakova, 11, korpus 1, kv. 35, all of Moscow, U.S.S.R.

Filed Mar. 31, 1981, Ser. No. 249,481

Int. Cl.³ H01F *41/06*

U.S. Cl. 242—7.09 **3 Claims**



1. An orthocyclic coil winding machine comprising:

a bed;

a turntable mounted on said bed;

a plurality of mandrels installed radially on said turntable;

each of said mandrels comprising:

a body;

a tapered supporting sleeve installed on said body;

a slotted head flange;

a removable tail flange;

a carrier with radial slots therein;

said head flange, removable tail flange and carrier with radial slots being installed on said supporting sleeve;

sectors which are tapered downwardly and inwardly from the ends on the inner surface thereof and have teeth forming grooves on the outer surface thereof;

elastic retaining rings installed on said sectors;

said sectors being radially movable installed in said radial slots of said carrier;

said tapered surfaces of said sectors mating with said tapered supporting sleeve;

a winding spindle coaxial with one of said mandrels, and a drive unit therefor;

a faceplate fixed to said winding spindle at the end proximate said one mandrel;

a shaft mounted on said faceplate at a location radially outward of the axis thereof;

said winding spindle being spaced apart from said one of said mandrels;

wire placer means mounted on the shaft of said faceplate in an overlying relationship with said one mandrel.

4,408,727

METHOD AND APPARATUS FOR THE AUTOMATIC SEVERING AND REATTACHMENT OF A WEB

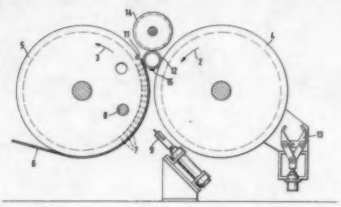
Hartmut Dropczynski, Konstrukteur, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 140,052

Claims priority, application Fed. Rep. of Germany, May 22, 1979, 2920707

Int. Cl.³ B65H *17/12, 19/26*

U.S. Cl. 242—56 R **11 Claims**



1. In a method for the severing and reattachment of a web of the type wherein the web is severed and the new head end of the web so formed is attached to a core which is wound on two driven support rolls between which the web runs, the improvement comprising the steps of: holding the web to the circumference of one support roll by suction; severing the web downstream of the held portion when the web is in the held condition; removing the finished roll; inserting a new core with a pressure roll in contact therewith; and adhering the new head end of the web by previously applying an adhesive to one of the head end of the web and to the core and removing the suction as winding of the core is started; wherein the one support roll is stopped in a first predetermined position, the web is severed in the first predetermined position of the support roll, the support roll is rotated to a second predetermined position and the head end of the web is adhered to the core when or after the support roll is in the second predetermined position and wherein the web is severed in said first predetermined position on the lower portion of the circumference of the support roll and the head end of the web is led, through continued rotation of the support roll before the new core is inserted in the wedge between the support rolls, into the second position for being adhered to the core.

4,408,728

ANTI-REVERSE ACTUATOR MECHANISM

John B. Pittman, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

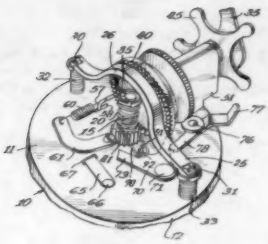
Filed Dec. 21, 1981, Ser. No. 333,119

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 A **10 Claims**

7. In a spin-cast reel having a center shaft (15), means for rotating the center shaft (15) to cause take-up of line within the reel, means for advancing the center shaft (15) lengthwise of the reel, a coil spring (20) surrounding said shaft for yieldably urging said center shaft to a rearward position in the reel, and an anti-reverse pawl (70) selectively positionable to prevent rotation in one direction of said center shaft as controlled by rotation of the center shaft, the improvement wherein said coil

spring (20) is yieldably rotatable with the center shaft (15) and has an end coil (90) extended away from the center shaft; and



said pawl and end coil having a motion-transmitting connection (91,92) therebetween.

4,408,729

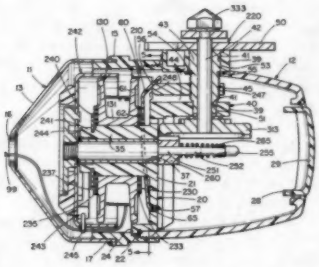
STAR DRAG SYSTEM FOR SPIN CAST REELS

Elvis W. Moss, Tulsa, Okla., and John T. Shackelford, Littleton, Colo., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 223,736, Jan. 9, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,920

Int. Cl.³ A01K *89/01, 89/02*

U.S. Cl. 242—84.5 A **11 Claims**



1. In a spinning reel including a cylindrical reel body having a deck plate, a forwardly extending hub affixed to the deck plate and having an opening therethrough, a spool supported on the hub forwardly of the deck plate, a center shaft extending axially through the opening in the deck plate and the hub, a crank drive mechanism mounted in the reel body for rotating the center shaft, the improvement including:

(a) bracket means extending rearwardly from the deck plate and having aperture means therrein;

(b) an externally threaded post means mounted in the aperture means in the bracket means and having a longitudinal axis lying substantially parallel to the deck plate, the axis of the post means lying radially of the center shaft;

(c) a wheel affixed to the post means;

(d) a drag plate having a body portion supported between the deck plate and the spool and applying pressure to the spool, the drag plate having a cam surface angled upwardly and outwardly away from the body portion of the drag plate;

(e) a drag actuator mounted on the post means for movement radially along the longitudinal axis of the post means;

(f) a contact head on the drag actuator extending through the deck plate and into contact with the cam on the drag plate, rotation of the wheel advances or retracts the drag actuator radially along the cam surface on the drag plate to increase or decrease the pressure applied by the drag plate on the spool.

4,408,730

PORTABLE WIRE DISPENSER

Vasant J. Shend'ge, London, and Geoffrey S. Thompson, Windlesham, both of England, assignors to Multicore Solders Limited, Hemel Hempstead, England

Filed Feb. 25, 1982, Ser. No. 352,205

Claims priority, application United Kingdom, Mar. 25, 1981, 8109291

Int. Cl.³ B65D *85/675;* **B65H** *49/00, 75/40*

U.S. Cl. 242—96 **3 Claims**

1. A hand-held portable dispenser for a solder wire comprising, in combination, a hollow cylindrical body having a closed end and an open end, an outlet member having a generally cylindrical portion force fitted into said open end of said body, said cylindrical portion having a helical passageway formed on its external surface, said helical passageway having a substantially semicircular cross-section, a substantially linear passageway of substantially semicircular cross-section formed in said helical passageway and extending from the outer end of said helical passageway to the outlet of the dispenser, said linear passageway being substantially parallel to the longitudinal axis of the body, a helical coil of solder wire disposed in and occupying substantially the entire cross-sectional area of said cylindrical body and having one free end extending through said helical passageway and said linear passageway in said outlet member, said free end of said wire turning through an angle of approximately 90° as it passes from said helical passageway into said linear passageway, whereby said wire can be withdrawn from said outlet member through said helical and linear passageways without any substantial tendency to slip back into said cylindrical body.

4,408,731

CREEL FOR A SPINNING MACHINE

Eduard Schenkel, Seuzach, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jun. 14, 1982, Ser. No. 388,096

Claims priority, application Switzerland, Jun. 24, 1981, 4167/81

Int. Cl.³ B65H *49/02;* **D02H** *1/00*

U.S. Cl. 242—131 **14 Claims**

1. A creel for a spinning machine having a center plane and a longitudinal direction of extent, comprising:

at least two rows of rotatably mounted roving bobbins located to each side of the center plane of the spinning machine;

each of said row of roving bobbins extending essentially parallel to the center plane;

each of the roving bobbins of a row being adjacently aligned with respect to one another and serving for paying-off roving therefrom and for infeeding the same to a related drafting arrangement;

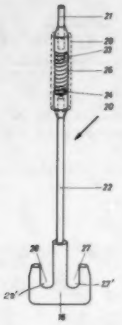
at least one row of substantially rod-shaped holders arranged to each side of the center plane and extending essentially parallel to said center plane;

each said row or rod-shaped holders being located behind one of the rows of bobbins defining a front row;

said holders having opposed ends;

one of the ends of each of the holders being rigidly mounted;

the opposite end of each of said holders being equipped with means defining at least two guides for rovings; and



said rovings extending directly from their roving bobbins by means of said guides to their related drafting arrangement.

4,408,732

STRIP FILM HANDLING DEVICE

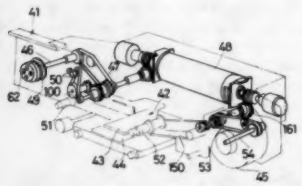
Shiro Toriumi, Zama; Kenjiro Ishii, Yokohama, and Seiichi Yamagishi, Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1981, Ser. No. 253,461

Claims priority, application Japan, Apr. 16, 1980, 55-51384[U]; Apr. 18, 1980, 55-52184; May 21, 1980, 55-68238; Nov. 19, 1980, 55-166373

Int. Cl.[3] **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—192 **24 Claims**



3. In combination for use with any selected film cartridge of a plurality of film cartridges, each containing a strip film wound on a reel in the form of a roll and having similarly positioned film feed outlets through which film is withdrawn from the cartridge and at least some of the cartridges having an opening through which a feed roller is insertable at respectively different positions, a strip film handling mechanism comprising:

drive means engageable with the reel of the cartridge held loaded in a predetermined position for rotatingly driving the reel, said drive means including interchangeable engaging members for engaging the drive means with the reel;

feed means for separating the leading end of the strip film from its roll and feeding the leading end from the cartridge, the feed means including a roller member movable into the film feeding outlet of the cartridge to contact the surface of the film wound on the reel;

a support member for supporting the roller member while permitting the roller member to advance or retreat between the frictional contact position and a retracted position, an assembly for bringing the roller member to the frictional contact, and a drive transmitting assembly for rotatingly driving the roller;

transparent guiding means for transporting the strip film from the feed means to a take-up station by way of an illuminating station; and

take-up means for winding up the strip film.

4,408,733

MAGNETIC TAPE CASSETTE

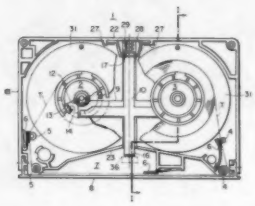
Kengo Ooishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 22, 1981, Ser. No. 304,465

Claims priority, application Japan, Sep. 24, 1980, 55-132591

Int. Cl.[3] **G11B** *15/32*

U.S. Cl. 242—199 **7 Claims**



1. A magnetic tape cassette comprising: a cassette case having upper and lower halves; first and second magnetic tape winding hubs arranged in respective right and left positions in an interior of said cassette defined by said upper and lower halves of said case, each of said two hubs comprising a first cylindrical wall forming a shaft hole adapted to receive a rotary drive shaft, and a second cylindrical wall formed coaxially with said first cylindrical wall, said second cylindrical wall having a plurality of engaging grooves formed in an inner surface thereof; locking means comprising a crosswise locking member slidably supported on a bottom of said lower half between said hubs, said locking member comprising a straight bar and oppositely extendable arms substantially in the form of a cross with an upstanding pawl on the outer end of each arm disposed intermediate said first and second cylindrical walls and a spring member, said locking member being moveable back and forth in the longitudinal direction of said straight bar and being urged in one direction by said spring member to bias said pawls into engagement with said grooves, rotation in at least one direction of said hubs being stopped by engagement of said locking pawls with said engaging grooves; a magnetic tape laid over said hubs; and a tape running guiding means arranged symmetrically right and left in said case so as to guide said tape across an opening in said case in a front portion thereof.

4,408,734

SYSTEM FOR GUIDING A MISSILE BY LIGHT BEAM

Wladimir Koreicho, Chilly Mazarin, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Jan. 23, 1981, Ser. No. 227,818

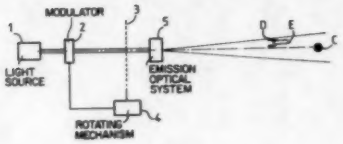
Claims priority, application France, Jan. 29, 1980, 80 01840

Int. Cl.[3] **F41G** *7/26*

U.S. Cl. 244—3.13 **6 Claims**

1. In a system for guiding a missile, comprising a source emitting a light beam of which the axis defines the direction of sight, at least one modulation sight placed in the path of the beam, means for producing a relative movement of rotation between the sight and the beam, and, on the missile, at least one detector and a calculating circuit for determining, from the output signal from the detector, the coordinates of the detector with respect to the direction of sight, the control surfaces of the missile being actuated as a function of said coordinates with a view to controlling the path of the missile on the direction of sight, the improvement comprising the modulation sight com-

prises transparent and opaque, and possibly semi-transparent sectors, defined by curves symmetrical with respect to the center of the sight, at least certain of these curves having for equation $f(\rho,\theta \text{ modulo } \pi)=0$, where ρ varies monotonically as



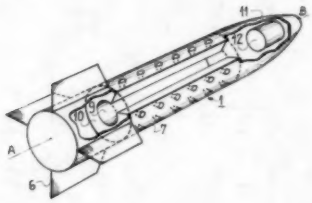
a function of θ, and defining 2n angles at the center which are equal whatever the radius in question, so that the duration of relative illumination of the detector remains equal to 50%, whatever its position.

4,408,735

PROCESS FOR PILOTING AND GUIDING PROJECTILES IN THE TERMINAL PHASE AND A PROJECTILE COMPRISING MEANS FOR IMPLEMENTING THIS PROCESS

Pierre Metz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 4, 1980, Ser. No. 204,039
Claims priority, application France, Nov. 9, 1979, 79 27712
Int. Cl.³ F41G 7/20; F42B 15/02
U.S. Cl. 244—3.22 **7 Claims**



1. A method for correcting the terminal portion of the ballistic trajectory of a rotating projectile directed toward a target; said projectile having a barrel of impeller each provided with at least one lateral nozzle equally spaced around the circumference of the projectile body and an optical sensor located within the nose section, said method comprising the steps of:

(a) measuring the period of rotation T of the projectile about its longitudinal axis (A-B);

(b) detecting the optical image (C_1) of the target (C) on the successive rotations of the projectile;

(c) measuring the polar coordinate (Pi) of this image of the target at least once during the period of rotation of the projectile;

(d) calculating the magnitude of the rate of change of the successive polar coordinate measurements;

(e) comparing this calculated magnitude to a predetermined threshold value S_1;

(f) measuring the instant of time T_d when the calculated magnitude rate exceeds the threshold value;

(g) triggering of a first impeller at time T_d, and then sequentially after a given delay a second, third and finally n^{th} impeller in relation to the measured period of rotation of the projectile so that the mean thrust of all the impellers is in the same direction to correct said terminal portion of trajectory.

5. A projectile rotating around its longitudinal axis (A-B) and having a barrel of n impellers equally spaced around the circumference of the projectile for generating an orientable lateral thrust P, and an optoelectronic sensor located within its nose-section, said optoelectronic sensor comprising:

(a) a clock source;

(b) a first electronic means for calculating the period of rotation T of the projectile;

(c) at least a linear array of optical detector cells extending radially from the longitudinal axis of the projectile, this detector array being located in the image plane of the lens;

(d) a second electronic means for detecting the polar coordinate (ρi) of the target image received on a detector cell on successive rotations of the projectile;

(e) a third electronic means for calculating the value of magnitude rate of change of the detected polar coordinate of the image target on successive rotation of the projectile;

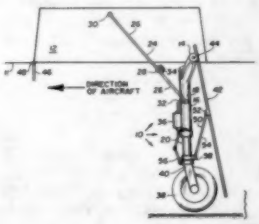
(f) a signal level comparator having inputs connected to the third electronic means and a threshold signal source for generating a triggering signal when said magnitude exceeds said threshold signal which is provided to a first impeller and sequentially via a time delay to a second, third, and finally to the n^{th} impeller so that the mean thrust of all the impellers is in the same direction to correct said terminal portion of tragectory.

4,408,736

LANDING GEAR DOOR MUD GUARD

Nathan Kirschbaum, Huntington, and Augustus Sclafani, East Northport, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,732
Int. Cl.³ B64C 25/10, 25/16
U.S. Cl. 244—100 R **10 Claims**



1. A combination fairing and splash guard for an aircraft landing gear comprising:

a door;

means for pivotally attaching the door to the aircraft;

a collar;

a means for rotatably attaching the collar to a moveable shock strut cylinder slidably disposed within a stationary shock strut cylinder of the landing gear;

a first pivot mounted on the collar;

a second pivot mounted intermediately on the door, said first and second pivots being parallel to a pivotal axis of the door; and

a rod attached at one end to the first pivot and at another end to the second pivot.

4,408,737

METHOD AND APPARATUS ENABLING A HORIZONTAL LANDING OF A FLYING BODY

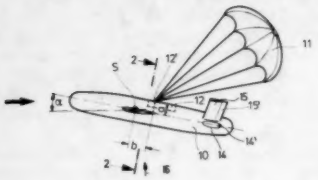
Hans Schwaerzler, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 97,201, Nov. 26, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,280

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852220

Int. Cl.³ B64D *17/80*

U.S. Cl. 244—110 D 2 Claims



1. An apparatus for horizontally landing a flying body having a center of gravity and steering means, comprising paraglider canopy parachute means having a given diameter and being normally stored in a top side portion of the flying body, said parachute means including load suspending means comprising a plurality of load suspending flexible cords divided into at least two groups of load suspending cords, said apparatus further comprising at least two pivot point means (**23, 24**) including a forward pivot point secured to said flying body forward of said center of gravity and rearward pivot point means secured to said flying body to the rear of said center of gravity, one group of load suspending cords (**26**) being connected to said forward pivot point (**23**) and the other group of load suspending cords being connected to said rearward pivot point means, each group of cords having a given constant length such that said one group of load suspending cords connected to the forward pivot point is longer than the other group of load suspending cords connected to the rearward pivot point means, whereby the load exerted by the flying body on the load suspending cords is suspended at least at two axially separated pivot points and so that said given diameter of said paraglider canopy parachute is at least about 70% smaller than the diameter of a conventional parachute for a substantially vertical landing of a comparable load.

4,408,738

VARIABLE ENERGY ABSORBING SYSTEM FOR CRASHWORTHY HELICOPTER SEATS

Bernard Mazelsky, West Covina, Calif., assignor to ARA, Inc., City of Industry, Calif.

Filed Sep. 21, 1981, Ser. No. 303,788

Int. Cl.³ B64D *25/04*

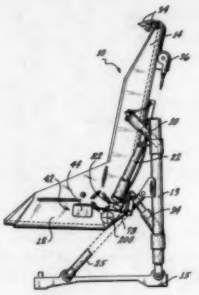
U.S. Cl. 244—122 R 39 Claims

38. A variable energy absorbing system for crashworthy seats in an aircraft to protect occupants of varying weights from crash induced injury comprising,

sensor means connectable to said seat for sensing the weight of an occupant thereof and for providing a signal in response thereto,

actuation means connectable to said sensor means in response to signals therefrom to actuate energy absorber means, and

energy absorber means connectable to said actuation means and connectable between the said seat and aircraft, said energy absorbing means being in the form of energy absorbing devices capable of absorbing energy at different levels of force in response to signals from said actuation



means, the said signals being responsive to varying weight of the occupant of said seat.

4,408,739

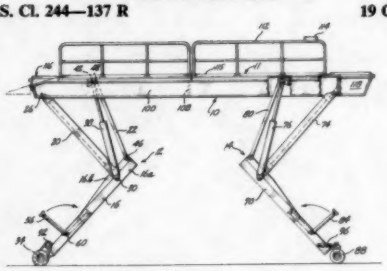
AIR TRANSPORTABLE CARGO LOADER FOR AN AIRPLANE

Christian K. E. Buchsel, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1980, Ser. No. 221,783

Int. Cl.³ B64C *1/22*

U.S. Cl. 244—137 R 19 Claims



1. An air transportable, self-contained aircraft cargo loader, comprising a cargo platform having opposite inboard and outboard ends with foldable wheeled leg assemblies supportively connected to said platform beneath said respective ends, the leg assembly at each platform end being movable between a folded position wherein said leg assembly is retracted to lie compactly against said platform through a range of extended positions to a fully extended position wherein said leg assembly projects generally downwardly from said platform, wheel means journalled to said leg assemblies operable to support said platform on the extended leg assemblies, and means constraining the leg assemblies to move along predetermined motion paths during extension and retraction, said motion paths for the wheel means of the leg assemblies extending generally in a substantially vertical line relative to the platform with the platform in a substantially horizontal position, said leg assemblies being dimensioned to position the platform substantially at cargo deck level of an airplane with the leg assemblies at least partially extended, independently operable power actuation means for the respective leg assemblies for extending and retracting each independently of the other and adapted for conjoint operation to extend and retract said leg assemblies substantially synchronously, the inboard end of the platform being adapted in conjunction with the inboard leg assembly so as to permit the platform to be advanced over the cargo deck

of the airplane and to be lowered onto the same whereby with the inboard leg assembly retracted and the inboard platform end resting on the airplane cargo deck and the outboard leg assembly extended to the ground the loader thus supported can be slid inwardly and outwardly of the airplane, and whereby with the platform still so supported and approaching full withdrawal from the cargo deck the inboard leg assembly may also be extended to the ground, and whereby with the platform resting on the cargo deck and with the inboard leg assembly retracted and inside the airplane the outboard leg assembly may be retracted for full insertion and stowage of the loader inside the airplane, and further whereby with the loader fully withdrawn from the airplane the platform may be raised and lowered in the manner of an elevator by synchronous extension and retraction movement of the leg assemblies while maintaining the platform substantially horizontal and may alternatively be positioned with the inboard and outboard ends at different heights to enable the loader to be employed as a loading ramp.

4,408,740

APPARATUS FOR ACCELERATION-FREE MOUNTING OF A BODY IN A SPACECRAFT

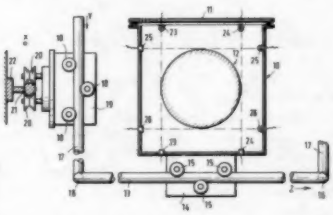
Peter Kleber, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,456

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024127

Int. Cl.³ B64G *1/22*

U.S. Cl. 244—158 R **9 Claims**



1. Apparatus for acceleration-free mounting of a body in a spacecraft comprising an evacuatable protection box adapted for enclosing therein without contact a relatively free floating body, means for monitoring the position of said body relative to x, y and z axes and to said protection box without physically contacting the body, means for supportingly guiding said protection box for movement along x, y and z axes corresponding to said body axes, and means responsive to outputs of said monitoring means indicative of movement of said body along its x, y and z axes corresponding to said monitoring means indiciative of movement of said body along its x, y and z axes for correspondingly moving said protection box along its corresponding x, y and z axes to compensate for body movement and thereby maintain the body out of contact with said protection box.

4,408,741

BINDING DEVICE FOR ELONGATED PIPES

Fumio Mimura, Kawasaki, and Hiroo Asakawa, Yokohama, both of Japan, assignors to Nichiei Distribution Systems, Inc., Kawasaki and Nippon Kokan Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 23, 1981, Ser. No. 286,367

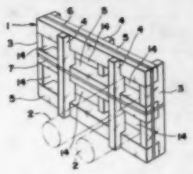
Int. Cl.³ F16L *3/22*

U.S. Cl. 248—68 CB **8 Claims**

1. A binding device for a plurality of elongated pipes comprising:

a plurality of sleepers of rectangular crosssection disposed in spaced and parallel arrangement to each other, at least a first pair of said sleepers being in a first vertical arrangement and at least a second pair of said sleepers being in a second vertical arrangement horizontally spaced apart from said first arrangement, a plurality of the elongated pipes being adapted to be placed side by side on and in transverse relation to each of said sleepers,

a plurality of spacers, each spacer being formed with at least one recess, said recesses being collectively adapted to couple with at least two outer surfaces of each of said



sleepers and being disposed in spaced arrangement to each other in a transverse relation to said respective sleepers, and

bundling strap means for tightly fastening and encircling said plurality of sleepers and spacers, whereby said sleepers and spacers extend respectively in spaced relation to each other and are assembled to form a plurality of spacers defined by the surfaces of said sleepers and spacers and adapted to receive the outer peripheral surfaces of said respective elongated pipes in tight contact relation thereto.

4,408,742

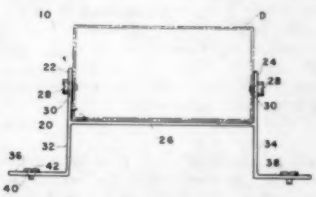
HANGER FOR RECTANGULAR-SECTION DOWNSPOUTS

George P. Korb, 7518 Harford Rd., Baltimore, Md. 21234

Filed Feb. 17, 1981, Ser. No. 234,964

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74 R **1 Claim**



1. In a hanger for a downspout of rectangular cross-section, means for fastening a rectangular downspout to the hanger, and means for affixing the hanger to a building, the improvement comprising: means for preventing twisting and vibration-loosening of a said rectangular downspout held in the hanger, including: a rectangular socket of first (**22**) and second (**24**) arms and a strut (**26**) joining the first and second arms together parallel at a distance proportioned for gripping tightly the sides of a said rectangular downspout between the first and second arms, all said arms and strut being planar, said means for fastening being means (**28**) for securing a rectangular downspout tightly in the rectangular socket against the strut, said means for affixing including means (**32, 34**) for spacing free of a said building a said rectangular downspout held; the means (**32, 34**) for spacing including parallel extension (**32, 34**) of said first and second arms past the strut, a respective foot (**36, 38**) on the end of each extension at right angles thereto, said means for affixing including means (**42**) for attaching each foot to a building;

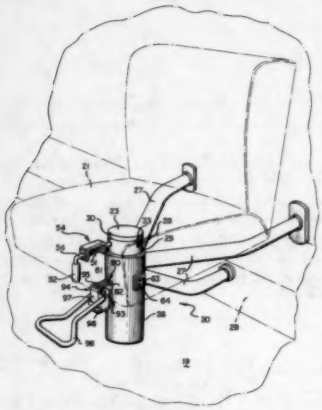
each foot oriented outboard of the respective said extension; all said extensions and feet being planar and substantially of the same width and thickness as the arms and strut, said means (42) for attaching, including a structure defining a fastener hole (40) in each foot; and said parallel extensions (32, 34) of said first and second arms located for flexibly pivoting said first and second arms about said strut by springing apart said feet.

4,408,743

SEAT WITH WEAR-RESISTANT MOUNTING

Robert W. DeWitt, Lombard, and Lester H. Feddeler, Elk Grove Village, both of Ill., assignors to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed Oct. 13, 1981, Ser. No. 310,778
Int. Cl.³ B61L 11/04
U.S. Cl. 248—285 6 Claims



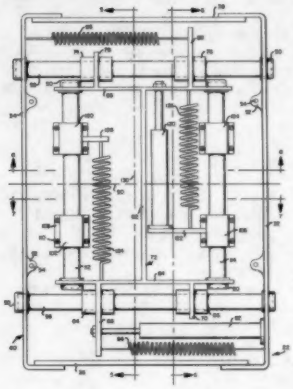
1. A seat assembly comprising:
a base member;
a vertically disposed, tubular intermediate member;
means mounting said intermediate member for vertical movement relative to said base member;
said tubular intermediate member having an upper portion terminating at a top edge defining an open upper end;
said upper portion of the tubular intermediate member having a cylindrical cross-section;
a vertically disposed trunnion member having a cylindrical cross-section;
said trunnion member having a lower portion received within said upper portion of the tubular intermediate member and an upper peripheral lip portion radially overlapping said top edge of the tubular intermediate member;
means on said trunnion member and on the upper portion of said tubular intermediate member mounting the trunnion member for rotation about a vertical axis;
said upper peripheral lip portion of the trunnion member having a lower surface engaging against said top edge on the upper portion of the tubular intermediate member without a friction-resistant surface therebetween;
a planar element fixed within said tubular intermediate member below its open upper end, said planar element having a flat upper surface and a lower surface;
said lower portion of the trunnion member having a flat bottom surface located adjacent said planar element;
a friction-resistant, wear-resistant member sandwiched between said flat bottom surface on the lower portion of the trunnion member and said flat upper surface on the planar element;
said planar element comprising means for supporting said trunnion member;
and means for supporting a seat atop said trunnion member.

4,408,744

COMPACT, PLANAR, MULTI-DIRECTIONAL VIBRATION ATTENUATOR SEAT SUPPORT

Raymond D. Thompson, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 24, 1980, Ser. No. 219,987
Int. Cl.³ B60N 1/08
U.S. Cl. 248—636 12 Claims



1. A vibration attenuator seat support comprising:
a relatively thin, generally planar seat support assembly for supporting a seat, the seat support assembly having a central plane thereof;
an intermediate assembly substantially completely contained within the seat support assembly and including means for permitting limited movement of the seat support assembly relative to the intermediate assembly along a first axis generally parallel to the central plane of the seat support assembly; and
a base assembly substantially completely contained within the seat support assembly and including means for permitting limited movement of the intermediate assembly relative to the base assembly along a second axis generally parallel to the central plane of the seat support assembly and extending in a direction generally perpendicular to the direction of the first axis.

4,408,745

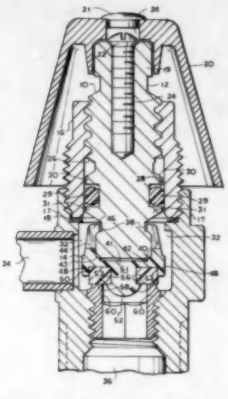
SWIVEL VALVE

Richard H. Swiers, and Richard G. Parkison, both of Louisville, Ky., assignors to American Standard, Inc., New York, N.Y.

Filed Dec. 11, 1980, Ser. No. 215,515
Int. Cl.³ F16K 1/34
U.S. Cl. 251—357 22 Claims

1. A faucet valve assembly comprising a valve stem and a swivel valve; one end of said valve stem defining a radially expanded foot member and an annular groove disposed about said stem adjacent said expanded foot member, the opposing end of said stem being adapted to receive a faucet handle; said swivel valve comprising an annular valve body having a bearing surface adapted to mate with the bottom radially expanded surface of said foot member, gripping means adapted to engage one end of said valve stem, said gripping means comprising a plurality of resilient vertically disposed arms spaced about the periphery of one surface of said valve body, said arms terminating in a plurality of inwardly and radially directed fingers adapted to engage said annular groove formed in said valve stem to provide free rotation of said valve stem independently

of the rotation of said valve; a dependent annular skirt disposed peripherally about the opposite surface of said valve body; an axially disposed neck element descending from said latter



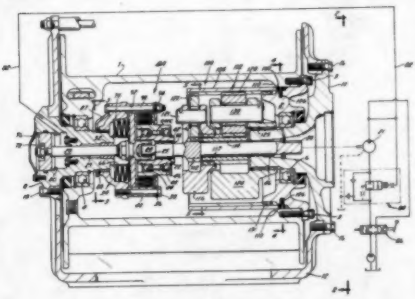
surface and terminating in an expanded knob; said skirt, neck and knob forming an annular recess; and a compression washer of resilient, compressible composition disposed in said annular recess; said washer having a valve seat engaging surface.

4,408,746

HYDRAULICALLY ACTUATED WINCH ASSEMBLY

James E. Marsch, and Herbert L. Eckert, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Jul. 9, 1981, Ser. No. 281,917
Int. Cl.³ B66D *1/22*
U.S. Cl. 254—344 **7 Claims**



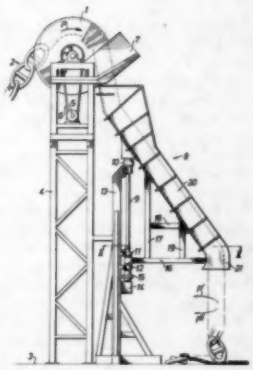
1. A hydraulically actuated winch assembly comprising a bearing support housing, a winch drum rotatably mounted in said housing, a power input shaft rotatably mounted in said housing and having a primary sun gear formed thereon, a common internally toothed ring gear secured to and within said winch drum, a secondary sun gear concentric to said power input shaft, a primary planetary gear system within said common ring gear and including a planet gear carrier having gear means in fixed constant mesh with said secondary sun gear for delivering power to said secondary sun gear, a plurality of planetary gears rotatably mounted on said carrier and in constant mesh with said primary sun gear of said input shaft and with said common ring gear for delivering power from said input shaft to said common ring gear, a secondary planetary gear system within said ring gear and including a secondary planet gear carrier fixed to said bearing support housing whereby said secondary planet gear carrier is anchored, a plurality of planet gears rotatably mounted on said secondary planet gear carrier and in constant mesh with said secondary sun gear and with said common ring gear for delivering power from said secondary sun gear to said common ring gear, whereby input power from said power input shaft is split between said two planetary gear systems and said power is delivered to said common ring gear for driving said winch drum, a brake assembly mounted within said housing and having a driving connection with said power input shaft, said brake assembly including an interleaved friction plate clutch for forming a releasable driving connection between said power input shaft and said bearing support housing, said brake assembly including spring means for normally urging said clutch into an engaged position to thereby lock said input shaft against rotation, said brake assembly also having hydraulically actuated means for releasing said friction plate clutch and thereby permitting rotation of said power input shaft, and a retainer plate mounted on said bearing support housing and within said drum and held against axial movement in one direction by a snap ring secured in said housing, said brake assembly being insertable in an axial direction in said drum and against said snap ring, and bolt means connected between said retainer plate and said brake assembly whereby the latter is axially fixed within said drum by said snap ring and can be assembled as a unit prior to insertion in said drum.

4,408,747

DEVICE AND METHOD FOR COLLECTING CHAINS OR THE LIKE

Carl-Henning Camitz, and Stig Lindgren, both of Ramnäs, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden

Continuation of Ser. No. 36,468, May 7, 1979, abandoned, which is a continuation of Ser. No. 864,037, Dec. 23, 1977, abandoned. This application Sep. 2, 1980, Ser. No. 183,673
Claims priority, application Sweden, Dec. 30, 1976, 7614747
Int. Cl.³ B66D *1/72*; B65H *54/80*
U.S. Cl. 254—382 **5 Claims**



1. A device for collecting coarse and heavy chains in a manner suitable for storage and transportation, comprising

(a) means for feeding a chain at a predetermined rate of speed;

(b) chain guide means for receiving said chain from said feeding means, and pivotable about a substantially vertical axis for motion above a non-rotatable stationary support means at which said chain is to be collected, said support means comprising a means upon which said chain is deposited link by link for subsequent transport;

(c) means for pivotally reciprocating said chain guide means over said support means along a circular arc of less than 180° between two terminal positions; and

(d) means for synchronizing the speed of reciprocation of

said chain guide means with said predetermined rate of speed;

(e) whereby the portion of said chain emerging freely from said chain guide means is deposited link by link at said support means in a plurality of well-ordered elongated loops.

4,408,748

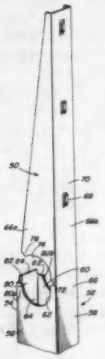
INTEGRAL FENCE POST AND CAP

Philip C. Lewis, Houston, Tex., assignor to Southwestern Pipe, Inc., Houston, Tex.

Filed Jun. 28, 1982, Ser. No. 392,880

Int. Cl.³ E04H *17/06*

U.S. Cl. 256—11 **7 Claims**



1. An integral fence post and cap comprising

a vertical post means having vertical walls defining a polygonal, horizontal cross section and providing planar side walls,

an upper portion of said post means defining a top rail receiving recess into which a horizontal top rail can be dropped,

at least one of said vertical walls extending vertically above said top rail receiving recess to form a rail enclosing portion having a polygonal cross section,

said rail enclosing portion being adapted to be bendable over said top rail to secure it in said recess,

said at least one vertical wall which extends above said top rail receiving recess defining a planar, coextensive continuation of a vertical wall of said post means,

said polygonal cross section of said rail enclosing portion defining, when bent over said rail, an angled coextensive continuation of a portion of said polygonal horizontal cross section of said post means, and

said rail enclosing portion defining, when bent over said top rail, a flat cap top means extending at least partially across the top of said top rail.

4,408,749

VARIABLE PITCH RAILING AND SYSTEM

Steven A. Zieg, Anaheim Hills, Calif., assignor to Mansion Industries, Inc., City of Industry, Calif.

Filed Jan. 18, 1982, Ser. No. 339,877

Int. Cl.³ E04H *17/14*

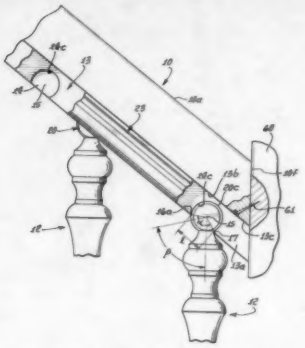
U.S. Cl. 256—67 **8 Claims**

1. For use in a connection between a one-piece rail and at least one baluster having a pivot at an end thereof, the improvement comprising

(a) the rail having an elongated recess sunk in one exterior lateral side thereof, and having at least one interior socket laterally intersecting said recess,

(b) the socket having a curved wall that pivotally receives the baluster pivot with the baluster projecting from the rail, the socket having an interior laterally facing wall defined by the rail, said curved wall and said laterally facing wall being of one-piece with the rail,

(c) the recess having L-shaped interior sides that receive and



confine an exterior moulding fitting to the rail which laterally confines the pivot in the socket between the moulding and said interior wall, that providing pivoting in said socket, said L-shaped interior sides being laterally exposed to the exterior.

4,408,750

METHOD AND ARRANGEMENT FOR SPREADING COVERING MATERIAL

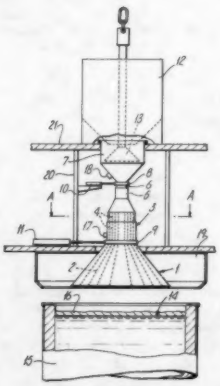
Kjell Andersson, Nyköping, and Ragnar Forsell, Oxelösund, both of Sweden, assignors to Scandinavian Lancers Aktiebolag, Hoganas, Sweden

Filed Mar. 12, 1982, Ser. No. 352,865

Claims priority, application Sweden, Feb. 26, 1981, 8101242

Int. Cl.³ C21C *7/00*

U.S. Cl. 266—216 **5 Claims**



1. Apparatus for spreading powdered or granulated material on the surface of a metal which is contained in an open metallurgical ladle located beneath said apparatus, said apparatus comprising dosing container means for providing a predetermined quantity of said material to be spread upon the metal melt surface, first and second valve means located above and below, respectively, said dosing container means for filling and emptying, respectively, said dosing container means, spreading means for spreading material from said dosing container means on said surface and including a plurality of truncated tubular

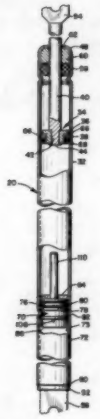
cone means arranged concentrically to each other for defining spreading passageways leading from said dosing container means towards said surface, said dosing container means including a plurality of concentrically arranged tubular wall means for dividing said dosing container into concentrically arranged divisional containers adjoining said tubular cones with each divisional container being associated with a respective spreading passageway, and a filling aperture which is common to all said divisional containers.

4,408,751

MULTI-CHAMBER TEMPERATURE COMPENSATED PNEUMATIC COUNTERBALANCE

Daniel P. Dodson, Florence, and George C. Ludwig, Marion, both of S.C., assignors to AVM Corporation, Jamestown, N.Y.

Filed Apr. 24, 1981, Ser. No. 256,997
Int. Cl.³ F16F 9/02
U.S. Cl. 267—120 **36 Claims**



1. A temperature compensated pneumatic counterbalance spring link comprising: a gas-charged cylinder with a cylinder wall having two ends; a piston rod and attached piston operably disposed in said cylinder intermediate said two ends with said rod projecting from one end of the cylinder; retaining means and seal means around said rod and maintained in said one end of the cylinder; the portion of said cylinder between the piston and the other end of said cylinder constituting a space and including at least one fixed partition wall means included in said space having means providing a fluid seal with said cylinder and dividing said space into a variable volume piston operating space and at least one auxiliary volume space; said wall means including temperature responsive valve means enabling substantially free gas flow in a direction away from the piston space and preventing gas flow in the opposite direction except when temperature to which the spring link is normally subjected falls below a predetermined value.

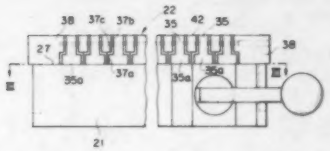
4,408,752

MAGNETIC CHUCK

Mamoru Uchikune; Kiyoshi Yanagisawa; Mutsukazu Tagami, all of Ueda; Taketo Shimizu, Nagano; Kunio Horiuchi, and Hiroo Sakaguchi, both of Ueda, all of Japan, assignors to Kanetsu Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Jul. 24, 1981, Ser. No. 286,561
Claims priority, application Japan, Aug. 21, 1980, 55-114077
Int. Cl.³ B25B 11/00
U.S. Cl. 269—8 **6 Claims**

1. A magnetic chuck operative to removably retain magnetic substances with magnetic force, comprising: a casing opening at one side; a top plate fixed to the open side of said casing to define a mounting surface for said magnetic substance and having a plurality of elongate magnetic main pole members and auxiliary pole members alternatively arranged in a side-by-side manner and integrally incorporated to close such open side and sandwich thin non-magnetic separators therebetween; and a magnet assembly received in said casing and slidable laterally of said main pole members and auxiliary pole members to magnetize and demagnetize the mounting surface of the top plate and having a plurality of magnetic yokes and permanent magnets alternatively arranged in a side-by-side manner in the sliding direction, the said main pole members having on the side facing said magnet assembly laterally extending portions partially overlapping the adjacent said auxiliary pole members so as to be interposed between the auxiliary pole members and the magnet assembly, and in contact with the magnet assembly to permit the magnet assembly to be slid and to enable the chuck to retain thin workpieces or several small size magnetic substances firmly.

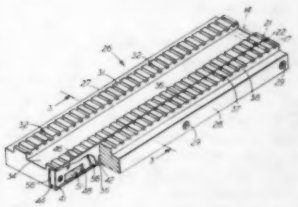


4,408,753

HOLDER FOR ALIGNING PARAMAGNETIC ARTICLES

James S. Chapman, Lee's Summit, and Anthony Tedeschi, Raytown, both of Mo., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 254,725, Apr. 16, 1981, Pat. No. 4,383,357.
This application Feb. 3, 1983, Ser. No. 463,681
Int. Cl.³ B25B 11/00
U.S. Cl. 269—8 **5 Claims**



1. A holder for aligning and supporting elongate, paramagnetic articles comprising:

a support, having a plurality of first grooves formed in a surface thereof for receiving one of a first group of the articles in each of such first grooves;

a magnet mounted adjacent to said first grooves, said magnet having a field extending substantially parallel to said first grooves;

a spacer mounted with a first surface against said one end of said first grooves and blocking the one end of said first grooves, said spacer having a predetermined thickness; and

a plurality of second grooves formed in a surface of said support, said second grooves extending in alignment with said first grooves against said spacer, whereby a second group of said articles, upon being placed into said second grooves, are magnetically attracted toward said first

group of articles to become spaced therefrom by the thickness of the spacer.

4,408,754

METHOD AND APPARATUS FOR GATHERING TOGETHER SHEETS OR THE LIKE INTO MULTI-SHEET PRINTED PRODUCTS, ESPECIALLY NEWSPAPERS AND MAGAZINES

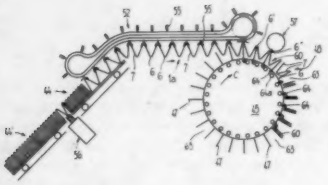
Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 17, 1981, Ser. No. 235,650

Claims priority, application Switzerland, Mar. 11, 1980, 1889/80

Int. Cl.³ B65H *39/00*

U.S. Cl. 270—52 25 Claims



1. An apparatus for gathering together sheets to form multi-sheet printed products, especially newspapers, magazines and periodicals, wherein the sheets are supplied from webs which are each constituted by printed sheets which are interconnected with one another at fold lines extending transversely with respect to the lengthwise direction of the webs, comprising:

a sheet associating device having support means for independently supporting each of at least two zig-zag folded webs defining a first web and at least one other web, each constituted by printed sheets which are interconnected with one another at fold lines extending transversely with respect to the lengthwise direction of the webs, at predetermined fold lines;

cutting means for cutting each web independently of one another at given ones of said fold lines to form cut sheets therefrom;

said cutting means cutting said first web after it has been introduced to said sheet associating device at given ones of said fold lines to allow the sheets to be supported at said sheet associating device between said support means and thereafter cutting said at least one other web after it has been introduced to said sheet associating device at given ones of said fold lines to allow the sheets thereof to be supported at said sheet associating device between said support means; and

means for bringing the cut sheets of said first web successively into a position aligned with the cut sheets of said at least one other web following the severing of said first web and depositing upon such sheets severed from said first web the sheets severed from said at least one other web.

16. An apparatus for gathering together sheets into multi-sheet printed products, comprising:

a support device for the spaced supporting of each one of zig-zag folded webs at their fold locations;

each of said webs comprising a substantially zig-zag folded web formed of sheets interconnected with one another at fold locations extending transversely with respect to the lengthwise direction of the web;

a cutting device for cutting each web at predetermined fold locations;

transport means which following the cutting of the sheets serves to bring the sheets of a first one of said webs into a position aligned with a next following web;

each support device containing support elements arranged in spaced relationship from one another;

each web resting upon said support elements at fold locations of the web;

all of the support devices being formed by a revolvingly driven drum member;

said support elements being structured as rib means upon which rest said webs and arranged at the circumference of the drum member and extending in the axial direction of said drum member;

said drum member comprising at least two infeed portions for the individual webs and a removal portion for superimposed sheets formed from said webs; and

said infeed portions and said removal portion being offset with respect to one another in the axial direction of the drum member.

4,408,755

METHOD AND APPARATUS FOR FORMING MULTI-SHEET PRINTED PRODUCTS, ESPECIALLY NEWSPAPERS AND MAGAZINES

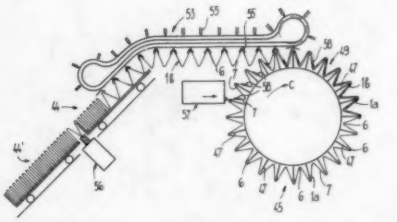
Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 17, 1981, Ser. No. 235,661

Claims priority, application Switzerland, Mar. 11, 1980, 1888/80

Int. Cl.³ B65H *39/00*

U.S. Cl. 270—52 28 Claims



1. A method of forming multi-sheet printed products, especially newspapers, magazines and periodicals, comprising the steps of:

supporting at least one first zig-zag folded web, constituted by printed sheets which are interconnected with one another at fold lines extending transversely with respect to the lengthwise direction of the web, at fold lines at spaced locations of said first zig-zag folded web;

thereafter and concurrently while said first web is supported at said fold lines substantially in a zig-zag form laying upon said first web at least one further zig-zag folded web likewise constituted by printed sheets which are interconnected with one another at fold lines extending transversely with respect to the lengthwise direction of the web, with the fold lines of said at least one further web being in alignment with the fold lines of said first web; and

supporting said at least one further web at fold lines thereof at the same locations as said first web.

11. An apparatus for forming multi-sheet printed products, especially newspapers, magazines and periodicals, comprising:

a support device for supporting at spaced support locations at least one first zig-zag folded web constituted by printed sheets interconnected with one another at fold lines extending transversely with respect to the lengthwise direction of the web;

said support device supporting said first web at predetermined fold lines thereof;

means for laying upon said supported first web and concurrently while said first web is supported at said predetermined fold lines substantially in a zig-zag form at least one

further zig-zag folded web constituted by printed sheets interconnected with one another at fold lines extending transversely with respect to the lengthwise direction of the web;

the fold lines of said at least one further web being in alignment with the fold lines of said first web; and

said support device supporting said at least one further web at predetermined fold lines at said spaced support locations.

4,408,756

COLLATOR WITH COLLATE MODE AND JOB SEPARATION MODE

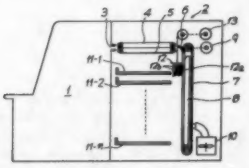
Kiyoshi Miyashita; Muneo Kasuga; Akira Shimizu, all of Hachioji; Fumitaka Ozeki, Inagi; Hiroshi Tsuda, Mitaka; Katsuhiko Kimura, Hino; Nobuoto Hattori, Hachioji; Norio Amemiya, Hachioji, and Masaru Yamazaki, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,376

Claims priority, application Japan, Jul. 31, 1980, 55-105440

Int. Cl.³ B65H *39/10*

U.S. Cl. 271—288 **6 Claims**



1. A collator for use in combination with a copy discharge apparatus such as a copying machine, a printing machine and the like which discharges a plurality of copies of originals in succession, said collator comprising:

a series of bins arranged in parallel with each other at a constant pitch;

feeding means for feeding the copies through a copy feed path along the series of bins at a constant speed, a distributor operative to move along said copy feed path across a predetermined number of bins to deliver the copies into said predetermined number of bins;

first setting means in response to actuation of an operation for setting the collator in a collate mode in which a plurality of copies of respective orginals are delivered into successive bins;

second setting means in response to actuation of the operator for setting the collator in a job separation mode in which all copies of each of successive originals are delivered into respective bins in succession, and

time pulse generating means for generating a timing signal for moving said distributor in said job separation mode, said time pulse generating means including

counting means for accumulating a signal supplied from said copy discharging apparatus to produce a count value N, said signal representing the number of said originals,

means arranged at an inlet portion of the collator for detecting a rear edge of the respective copies to produce a copy detection signal,

variable timer means for settiing, in response to the copy detection signal supplied from said copy detecting means upon detection of the rear edge of the last copy of an Nth original, a set time represented by $b+(N-1)xa/V_1$, wherein a is said constant pitch of the series of bins, b is a distance from said copy detecting means to the first bin viewed in a copy feed direction and V_1 is said constant copy feeding speed, said timing signal which defines the timing for advancing the distributor bin by bin being produced at a completion of said set time.

4,408,757

SHEET SEPARATING DEVICE

Jay M. Yarm, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 28, 1982, Ser. No. 343,686

Int. Cl.³ B65H *29/56*

U.S. Cl. 271—311 **5 Claims**

1. In a photocopy machine wherein a toner image is produced on a sheet of copy paper and is fused thereto by passing the sheet of copy paper between a pair of fusing rollers, at least one of which is heated and has a relatively soft outer surface, a sheet separating device for stripping sheets of copy paper from the heated fuser roller, said device comprising:

A. fixed support means located adjacent the heated fuser roller,

B. an elongate member pivotably mounted on said support means with a free end of said elongate member in juxtaposition with the outer surface of said heated fuser roller,

C. a stripper finger pivotally connected to said free end of said elongate member and having a knife edge formed at the free end of said stripper finger, and

D. resilient means interconnecting both said elongate member and said stripper finger with said fixed support for normally maintaining said elongate member and said stripper finger in substantial alignment and with said knife edge in scraping engagement with said surface of said roller, but acting to move both said elongate member and said stripper finger out of said substantial alignment and thereby move said knife edge away from said surface in response to a force exerted on said elongate member or said stripper finger in a direction which would tend to cause said knife edge to gouge into said surface.

4,408,758

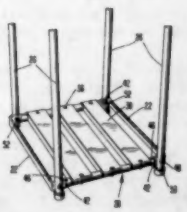
FOOT SUPPORT FOR LAWN CHAIR SWING

Herbert S. Gurbst, Kingston, and William Fulton, Dallas, both of Pa., assignors to Roth American, Inc., Wilkes-Barre, Pa.

Filed Oct. 30, 1980, Ser. No. 202,308

Int. Cl.³ A47C *15/00*

U.S. Cl. 272—85 **2 Claims**



1. A foot support structure disposed between and below a

pair of opposed seats in an oscillating lawn chair swing, the foot support structure comprising:

a first slat support rod;

a second slat support rod;

a first impact absorbing flexible plastic tube secured to and disposed between a first end of each of the first and second slat support rods to form an outer edge of the foot support;

a second impact absorbing flexible plastic tube secured to and disposed between a second end of each of the first and second slat support rods to form another outer edge of the foot support, said first and second flexible plastic tubes being generally parallel with an axis of oscillation of the lawn chair swing;

at least one floor slat secured to and disposed between said first and second slat support rods and also disposed between said first and second plastic tubes; and

means for suspending the foot support structure from the lawn chair swing.

4,408,759

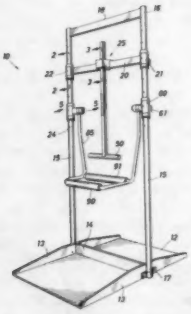
TOTAL RESISTANCE GYM

J. R. Reneau, and Richard D. Relyea, both of Austin, Tex., assignors to Bullseye Gun Centers, Inc., Austin, Tex.

Filed Feb. 27, 1980, Ser. No. 125,202

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—131 **4 Claims**



1. An exercise device comprising:

(a) a frame extending above an open area;

(b) an adjustable resistance means mounted on said frame providing constant two-way resistance to in line reciprocating forces exerted by a user, said resistance means including spring biased friction drag means for resisting the forces exerted by a user;

(c) handle means operatively associated with said resistance means and movable with respect thereto so as to transfer energy exerted by a user during an exercise program, said handle means including an elongated arm which is in sliding contact with said friction drag means;

(d) said resistance means further including rotary drag brake means for resisting the forces exerted by a user, said rotary drag brake means comprising a sleeve guide having a protrusion extending therefrom, said protrusion including threaded hole means, a support shaft threadably secured to said protrusion, a pair of spaced and opposite friction pads simultaneously engageable about said handle means, said friction pads affixed to metal backing plates mounted on said support shaft, cylindrical housing means enclosing said rotary drag brake means, spring means mounted on said support shaft providing a compressive force acting against said friction pads, and locking means for preventing rotational movement of said friction pads and said backing plates; and

(e) a bench positioned at the open area beneath said frame permitting a user to perform various exercises on manipulating said handle means, which exercises are resisted by said resistance assembly and are performed from a lying or sitting position.

4,408,760

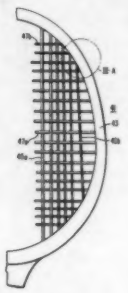
STRUNG RACQUET

Harry Ferrari, 144 W. Swissvale Ave., Pittsburgh, Pa. 15218

Division of Ser. No. 939,481, Sep. 5, 1978, Pat. No. 4,330,132. This application Nov. 9, 1981, Ser. No. 319,576

Int. Cl.³ A63B *49/00*

U.S. Cl. 273—73 D **9 Claims**



1. A racquet for tennis, squash, racquet ball or the like, where, in play, the racquet strikes a ball, said racquet including a frame having holes and also including string threaded through said holes, said string being made up of separate short string lengths, each said string length having predetermined selectable properties or structure, each said string length threaded through a plurality of holes and each string length being subject to a predetermined tension, coordinated with its properties or structure, the coordination of said properties or structure of said string lengths being such that the deflection of a length produced by the impact of a ball around the periphery of the racquet is substantially equal to the deflection produced by a like impact of said ball near the center of said racquet, and means for securing each said string length in at least a pair of said holes through which it is threaded, so that the tension of said length is maintained under repeated impacts of said ball.

4,408,761

GAME AND GAME DEVICES

William McAllister, London, England, assignor to McAllister (Sports Games) Limited, London, England

Filed Sep. 2, 1981, Ser. No. 298,733

Claims priority, application United Kingdom, Dec. 4, 1980, 8038885

Int. Cl.³ A63F *7/06, 7/40*

U.S. Cl. 273—85 R **9 Claims**

6. A table game, comprising:

a table having a playing surface and a goal at each end;

a plurality of playing devices, each device comprising a housing means, including:

a semi-spherical shaped hollow member providing a domed upper outer surface;

a base plate mounted on an underside of said hollow member;

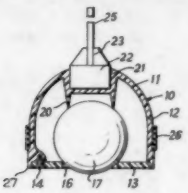
means defining a central aperture in said base plate, said central aperture having a ball means supporting edge;

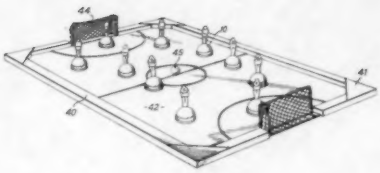
said hollow member including a plurality of inwardly extending projections each having a free end and each extending inwardly within said hollow member;

ball means rotatably mounted in said base plate and projecting slightly through said central aperture, each of said free ends of said inwardly extending projections contacting said ball means to hold said ball means in contact with said

internal edge of said central aperture and to keep said ball means projecting slightly through said central aperture, while enabling said ball means to rotate easily;

said housing means having external side and bottom surfaces





forming a sharp lower braking edge on said housing means, said lower edge achieving a braking effect when said housing means tilts to engage said lower edge with said playing surface;

cues for striking said playing devices; and a ball.

4,408,762

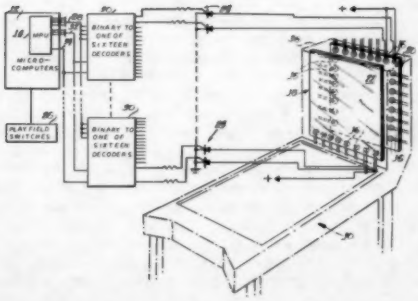
ELECTRONIC PINBALL GAME

Arthur L. Brey, Antioch, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Continuation of Ser. No. 92,993, Nov. 9, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 273,246

Int. Cl.³ A63F *7/02*

U.S. Cl. 273—121 A **8 Claims**



1. In a pinball machine which is controlled by a micro computer including a micro processing unit and which includes a plurality of switches on its playfield which are actuated by the pinball and provide signals to the micro computer, a display means comprising an infinity box including a one-way mirror disposed in the box, a two-way mirror disposed in said box in spaced relation to said one-way mirror, and a plurality of lamps disposed so as to provide repetitive images to the viewer of the display means, said lamps being disposed in the space between the two mirrors, and a plurality of switch means for energizing respective lamps, said micro processing unit being connected to said plurality of switch means so as to repetitively actuate said plurality of switch means in a predetermined sequence in accordance with the actuation of the playfield switches, whereby the lamps are energized in the predetermined sequence to create apparent rotational motion of the repetitive images of the display means, the micro processing unit repetitively actuating said plurality of switch means at different sequential speeds as determined by different play related functions to create apparent rotational motion at different speeds, said play related functions being determined by the actuation of predetermined playfield switches.

4,408,763

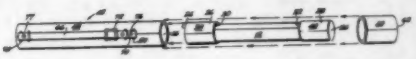
GAMEBOARD AND CARRYING CASE

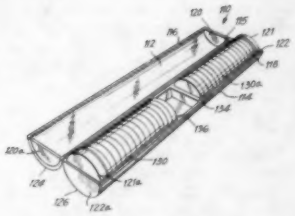
Charles R. Simons, 19 W. Thompson Ave., Pleasantville, N.J. 08232

Continuation-in-part of Ser. No. 236,720, Feb. 23, 1981, Pat. No. 4,381,113, which is a continuation of Ser. No. 952,311, Oct. 11, 1978, Pat. No. 4,252,324, which is a continuation-in-part of Ser. No. 748,820, Dec. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 674,986, Apr. 8, 1976, abandoned. This application Feb. 22, 1982, Ser. No. 350,617

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—286 **6 Claims**





1. In combination, a carrying case, a gameboard, a pair of die tossing cups, play pieces and a game pack for storing the play pieces,

said gameboard comprising a sheet of pliable material of uniform thickness having a first and a second pair of opposed right-angularly arranged margin edges spaced from one another a first and a second predetermined distance respectively, and each edge being of said uniform thickness, said gameboard being rolled into a roll and defining a bore of generally circular cross section throughout its length, said length being of a length equal to said first predetermined distance;

said pair of die tossing cups comprising a first and second end cap, said first end cap and said second end cap each having an open end and including a closed circular end wall and a cylindrical axially extending side wall of circular cross section of a predetermined inner diameter substantially equal to the diameter of said gameboard when rolled and each of said end caps including said side walls and end walls being of a common predetermined outer diameter, and each of said end caps being positioned on the ends of said rolled gameboard with the end wall of each cap being in abutting engagement with one of the margins of said gameboard along said second pair of opposed edges and captivated within said end caps and within said axially extending side walls of said end caps, each of said end caps being of an axial length substantially

less than one-half the distance between said second pair of opposed edges; and

said carrying case comprising a longitudinally-extending tubular container of circular cross-section of an inner diameter substantially equal to but slightly greater than the outer diameter of the cylindrical side walls and end walls of the end caps, said case having a closed end and an open end, and said gameboard and end caps being in said container, said container snugly jacketing said gameboard and end caps, said container being of an axial length substantially equal to but slightly greater than the first predetermined length of same gameboard and the thickness of the end walls of said first and second end caps and said container having an outer uniform diameter said container being comprised of a formed sheet of pliable material of uniform thickness;

cap means for said open end of said tubular container, said cap means comprising a cup-shaped member of a diameter substantially equal to said outer diameter of said container and having an axially extending skirt sized to and snugly jacketing said container adjacent said open end and closing said open end of said container; and

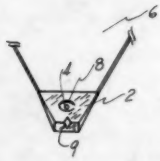
said game pack comprising an openable receptacle of rigid plastic which when closed is essentially a closed tube, said receptacle comprising two corresponding portions joined together by closure means on the axial length of the receptacle being capable of closure along edge strips of each portion 180° from said closure means, said portions having end walls which reinforce the firmness of closure of the receptacle, there being present in at least one of said receptacle portions at least two divisions, said divisions being sized to hold play pieces all of which are sized and configured of non-interlocking configuration to be nested within said divisions such that the play pieces cannot substantially move except for axial movement within said receptacle when it is closed.

4,408,764

STICK AND PEG GAME DEVICE

Adolph A. Morgan, 932 Garfield Ave., Belvidere, Ill. 61008

Filed Feb. 20, 1981, Ser. No. 236,257
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—341 **1 Claim**



1. A stick and peg game device comprising for use on the ground or other surface,

plate means, said plate means comprising a flat plate in the form of a trapezoid wherein the thickness of the plate is reduced uniformly proceeding from the short top to the long base of the trapezoid, provided with peg mounting means in the form of a "V" slot in the upper edge of the short top of the trapezoid,

peg means operably mounted on said plate means and disposed such that a portion thereof rests in said "V" slot and one end thereof rests on the ground and the other end is free and extends above the upper surface of said plate means,

field marking means operably attached to the corners at the ends of the long base of the trapezoid, and

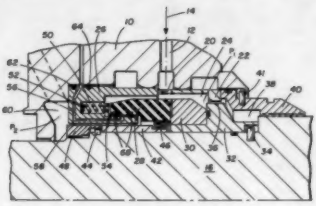
stick means.

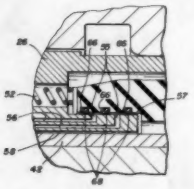
4,408,765

DIFFERENTIAL PRESSURE CONTROL FOR GAS SEAL IN TURBO MACHINERY

William J. Adelmann, Jr., Westchester, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 6, 1980, Ser. No. 194,110
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—3 **5 Claims**





1. In turbo machinery for gas compression including a rotating shaft, a non-rotatable gas seal of carbon composition generally surrounding a portion of said shaft and adapted for slideable displacement thereover, a rotatable running ring having a radial face situated contiguously opposed to a radial face on said gas seal, force generating means on the opposing face of said gas seal or said ring effective during the course of rotation to create aerodynamic forces urging lateral separation between the contiguous opposed faces of said gas seal and said running ring by slideably displacing said gas seal away from said running ring, and spring means axially urging said gas seal toward said running ring in balanced opposition to the aerodynamic forces created by said force generating means to effect a controlled leakage clearance between the opposed faces of said gas seal and said running ring, the improvement comprising secondary seal means contained in a clearance defined in a flow path of the gas between the relatively sliding surface of said gas seal and its supporting surface thereat for effecting a controlled pressure seal in said seal clearance while concomitantly effecting a predetermined limit of frictional drag force imposed against slideable displacement of said gas seal and correlated to the operational displacement required of said gas seal, said secondary seal means comprising at least two tandemly arranged resilient O-ring gaskets in said seal clearance and a bleed port communicating from inward of said seal clearance and between said O-rings to an outlet at a gas pressure of lower value than the gas pressure exposed to the inlet surface of said gas seal.

4,408,766

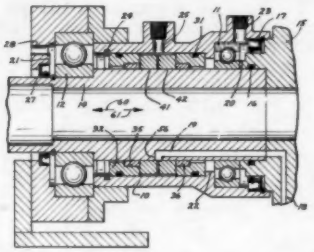
ROTARY SEAL APPARATUS WITH DUAL SELF-CENTERING ANNULAR FACE SEALS

Ivor N. Paech, Edwardstown, Australia, assignor to Longyear Australia Pty. Ltd., Mitchell Park, Australia

Filed Nov. 29, 1982, Ser. No. 445,351
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—3 **11 Claims**

1. Rotary seal apparatus for permitting the transfer of fluid under pressure from an inlet in a stationry housing having an

inner circumferential wall portion to an inlet of a passage in a drivable member rotatably mounted by the housing while permitting leakage fluid to flow in opposite axially directions from the housing inlet to housing outlets comprising first and second annular sealing means respectively mounted axially between the housing inlet and drivable member inlet and one of the housing outlets, and the housing inlet and drivable member inlet and the other of the housing outlets for forming fluid seals with the housing circumferential wall portion, in conjunction with the drivable member and housing forming a seal chamber to which said inlets open, and in conjunction with the drivable member provide annular leakage fluid clearance spaces that open to the seal chamber, said first and second means having axially adjacent annular sealing surfaces, and a first and second annular seal mounted in the seal chamber to surround the drivable member, said seals being freely rotatably



and axially movable relative one another, the drivable member and the housing when no fluid under pressure is applied at the housing inlet, and having axially remote ends that have annular surfaces for abutting against the axially adjacent one of the first and second means sealing surface to form fluid seals therewith when fluid under pressure is applied to the seal chamber, axially adjacent ends that have radially extending surfaces abuttable against one another when no fluid under pressure is applied to the housing inlet and inner circumferential surfaces to provide an annular clearance space with the drivable member to permit leakage fluid flowing therethrough to the first and second means clearance spaces when fluid under pressure is applied to the housing inlet to flow radially between the seals to the drivable member inlet, the housing inlet and drivable member inlet opening radially to the seal chamber adjacent the axially adjacent ends of the seals.

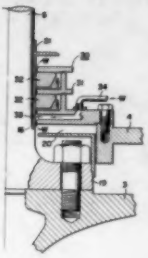
4,408,767

SHAFT SEALING DEVICES FOR HYDRAULIC MACHINES

Takuya Kako, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 152,316, May 22, 1980, abandoned. This application Jan. 12, 1982, Ser. No. 338,970
Claims priority, application Japan, May 31, 1979, 54-67759
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—27 **3 Claims**

1. In a shaft sealing device for a hydraulic machine comprising a packing box provided about a rotatable shaft of the hydraulic machine, said shaft being connected to a runner of said machine, and a number of packings encased in the packing box so that sliding surfaces of the packings are urged against the rotatable shaft for preventing water in a high-pressure space of the hydraulic machine adjacent said packing box from leaking out through gaps between the sliding surfaces of the packings and the rotatable shaft, the improvement wherein said shaft sealing device further comprises water supply means opening intermediately between said packing box and said high-pressure space for supplying water from a source of water at least at a time when said runner of the hydraulic machine is rotated in compressed air, passage means for guiding the thus supplied water to the sliding surfaces of said packings, said supplied water preventing compressed air from leaking out through said shaft sealing device, each of said packings being provided with a cutoff portion along a high pressure side edge of its sliding



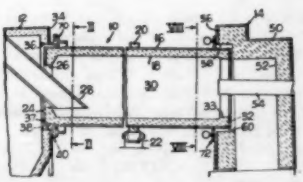
surface and each of said packings being made of 40 to 90 wt. % of tetrafluoroethylene resin mixed with a filler of the remaining wt. % and molded under a pressure into a predetermined shape.

4,408,768

GAP ADJUSTING ECCENTRIC PIN FOR ARTICULATED SEALS OF ROTARY KILNS

Carl F. Novotny, Greenfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 4, 1981, Ser. No. 327,608
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—84 **4 Claims**



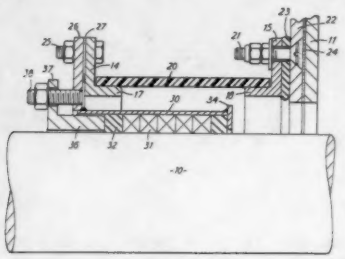
1. A seal for use in sealing an annular opening between a stationary member and a rotating cylinder which is telescopically arranged in said stationary member, said seal comprising an annular ring member circumscribing said cylinder adjacent said stationary member and closing said annular opening, said annular ring member formed of a plurality of circumferentially extending ring segments, means for pivotally connecting circumferentially contiguous segments to each other and permitting adjustment of the inner circumferential dimension of said ring comprising an eccentric pin pivotally connecting contiguous segments; said eccentric pin having a neck portion and a base portion having a common central axis; said neck and base portions each engaging one of said contiguous segments; said eccentric pin also having a body portion disposed between said neck and base portion; said body portion having a central axis disposed away from and parallel to the central axis of said neck and base portion; and said body portion pivotally engaging the second of said contiguous segments.

4,408,769

STUFFING BOX WITH OUTER FLEXIBLE TUBE TO ALLOW SHAFT GYRATORY MOVEMENTS

Erland Wolff, Greenbrae, Calif., assignor to Jude Engineering, Inc., San Francisco, Calif.

Filed Sep. 21, 1982, Ser. No. 420,891
Int. Cl.³ F16J 15/18
U.S. Cl. 277—105 4 Claims



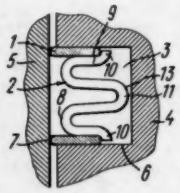
1. A stuffing box comprising two hollow annuli spaced apart and adapted to surround a shaft spaced from it, said annuli having annular flanges projecting towards each other, a flexible tube having its opposite ends seating on the annular flanges and secured thereto in gas-tight manner, a rigid tube within the flexible tube and spaced radially from it and adapted to surround the shaft and to be spaced from it, a radially inwardly extending flange at one end of the rigid tube, packing rings within the rigid tube, a tubular presser member in the other end of the rigid tube, and means for supporting the presser member and urging it into the rigid tube to compress the packing rings against said flange.

4,408,770

PISTON RING ASSEMBLY WITH TANGENTIAL EXPANDER

Rusaam S. Nemets, Sirenevy bulvar, 57, kv. 50; Vladimir G. Kislov, Lomonosovsky prospekt, 4, korpus 1, kv. 60; Efim S. Gorbulev, Tovarischesky pereulok, 9/11, kv. 5., all of Moscow; Ivan A. Koval, ulitsa Girshmana, 18, kv. 5., Kharkov; Boris S. Eremenko, Moskovsky prospekt, 96a, kv. 273., Kharkov; Felix A. Brainman, ulitsa Derzhavinskaya, 2, kv. 264., Kharkov; Jury M. Kontsov, ulitsa Krasnova, 14, kv. 29, Odessa; Anatoly V. Adamovich, 2-ya ulitsa Marinoi Roschi, 14a, kv. 35; Lev A. Burov, Kutuzovsky prospekt, 33, kv. 253., both of Moscow, and Viktor P. Moldavanov, ulitsa Perekopskoi divizii, 19, kv. 52., Odessa, all of U.S.S.R.

Filed Apr. 14, 1982, Ser. No. 368,225
Int. Cl.³ F16J 9/06
U.S. Cl. 277—140 3 Claims



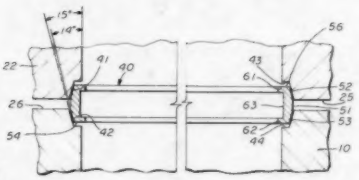
1. A piston ring assembly comprising a pair of flat rings and a tangential expander installed between said flat rings adapted to support said rings in contact with the wall of a groove in which said assembly is installed; said tangential expander comprising an annular integrally bent serpentine spring having a plurality of vertically extending webs and alternatively connecting horizontally extending flanges terminating in vertically extending bearing shoulders therebetween, said horizontally extending flanges respectively defining annular surfaces on which said rings are supported in contact with the walls of said groove, and said groove, and said vertical shoulders defining a thrust bearing for said rings; each vertically extending web being bent to form at least one fold extending into the interior of the piston ring assembly with the fold portions defining said bend extending substantially horizontally and the bend being such that the horizontal fold portions remain spaced from each other during use.

4,408,771

HIGH PRESSURE SEALING CONNECTION WITH METAL SEAL

William S. Shelton, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,143
Int. Cl.³ F16J 15/08
U.S. Cl. 277—206 R 6 Claims



1. A metallic sealing ring for sealing between connected first and second coaxially aligned and centrally bored members having opposed frusto-conical surfaces at their joined ends, said sealing ring having upper and lower annular end surfaces which reside in planes transverse to the axis of the sealing ring;

an external peripheral surface comprised of a central circular cylindrical surface, a lower frusto-conical surface extending from said lower annular end surface to said circular cylindrical surface in a downwardly convergent coaxial relationship with said sealing ring;

an upper frusto-conical surface extending downwardly from said upper annular end surface to said circular cylindrical surface in an upwardly convergent coaxial relationship with said sealing ring; and

upper and lower radial flanges extending into the interior of said ring at the upper and lower ends of said sealing ring, respectively, said sealing ring having an enlarged bore section as defined by a central inner peripheral surface intermediate said upper and lower radial flanges and extending therebetween, and said sealing ring being adapted to be received in the bores of said coaxially aligned members for effecting a fluid-tight pressure energizable sealing relationship with the opposed frusto-conical surfaces of the coaxially aligned members.

4,408,772

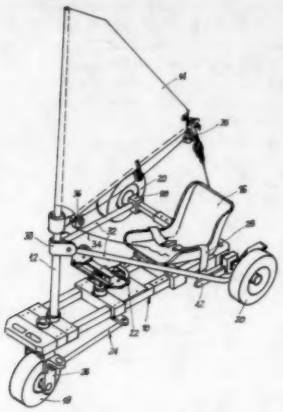
SAILING VEHICLE

Armin Höllwarth, Waldstr. 25, 6108 Darmstadt-Weiterstadt, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,926
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951995
Int. Cl.³ B62B 3/00
U.S. Cl. 280—1 9 Claims

1. A sailing vehicle with a collapsible frame comprising several supports and struts and having at least one sail mast, at least one seat, two rear moving elements and one forward moving element, the latter being steerable via a steering suspension, characterized in that the frame (10) consists of two

longitudinal supports (44) which are collapsible at their center section, a cross arm (46) which is detachably connected to the rear end of the longitudinal supports, a plurality of identically constructed transverse struts detachably connected to the longitudinal supports to unify the frame, the mast (12), the seat



(16), the forward moving element (18', 18''), and the steering suspension (24, 62, 64, 86) being supported by separate ones of the transverse struts (48) with at least the transverse strut supporting the seat being connected to the longitudinal supports for adjustment lengthwise thereof.

4,408,773

SELF PUMPING, LEVEL REGULATING APPARATUS FOR VEHICLES, ESPECIALLY AUTOMOBILES

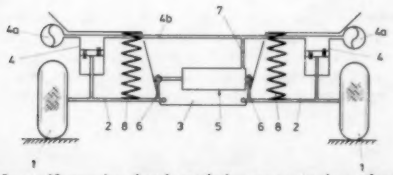
Theo Meller, and Heinz Knecht, both of Eitorf, Fed. Rep. of Germany, assignors to BOGE GmbH, Eitorf, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 258,998

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020050

Int. Cl.³ B60G 17/00

U.S. Cl. 280—611 8 Claims



1. In a self pumping, level regulating apparatus in a wheeled vehicle, comprising at least one damping hydropneumatic telescoping spring element with a gas spring chamber, and an automatic pumping and regulating element for pumping oil into the working chamber of the telescoping spring element as a function of the spring motion of at least one wheel axle of the vehicle for increasing the vehicle level, and, upon exceeding of a predetermined level, for delivering oil back from the working chamber of the telescoping spring element, the improvement characterized in that the hydropneumatic telescoping spring element is separate from the pumping and regulating element and is connected in the region of a vehicle wheel between the vehicle body and the wheel axle, and in that the pumping and regulating element comprises a pumping means, level regulating means and an oil storage reservoir in a compact construction and is separately disposed generally in the central area of the vehicle relative to opposed wheels and is connected to be actuated and controlled by the spring motions and relative positions of a generally centrally located part of a wheel axle, and wherein the pumping and regulating element is actuatably disposed between two upwardly directed levers that are rigidly fixed on two associated swinging axle halves in the region of their articulation to the vehicle body.

4,408,774

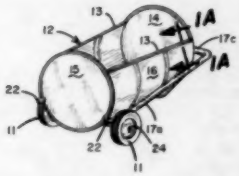
TWO-WHEEL CART

Richard L. Raskob, 19835 Larkin Rd., Corcoran, Minn. 55340

Filed May 15, 1981, Ser. No. 264,060

Int. Cl.³ B62B 1/26

U.S. Cl. 280—47.26 4 Claims



1. Two-wheel cart for transporting and storing a quantity of a given solid material, said two-wheel cart comprising:

a. a body means including a closed cylinder having a tapered opening defined in its circumferential wall by two opposed edges which extend from the top of the body to the bottom of the body, the distance between the opposed edges being at a maximum at the top of the body and decreasing to a minimum at the bottom of the body;

b. a cart frame including a handle member, an axle, and means for attaching the cart frame to the body; and

c. two wheels rotatably attached to the cart frame axle.

4,408,775

APPARATUS FOR SUSPENDING A TRUNNION MOUNTED AXLE ASSEMBLY FROM A VEHICLE

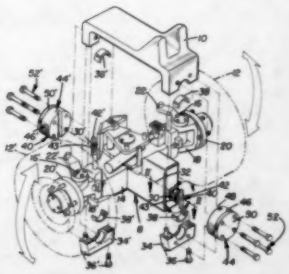
Harold V. Hildebrecht, Cleveland, Ohio, assignor to Tewmotor Corporation, Mentor, Ohio

PCT No. PCT/US81/00121, § 371 Date Jan. 26, 1981, § 102(e) Date Jan. 26, 1981, PCT Pub. No. WO82/02519, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 26, 1981, Ser. No. 275,080

Int. Cl.³ B60G 11/02

U.S. Cl. 280—95 R 7 Claims



1. In an axle assembly (8) for a vehicle frame (10) having an axle (14) and a cylindrical trunnion shaft (30), said cylindrical trunnion shaft having an end (43) and a longitudinal trunnion

axis (32) and being rigidly connected to said axle (14), said longitudinal trunnion axis (32) being oriented normal to said elongate axle (14) and said trunnion shaft (30) being rotatable with and in response to pivotal movement of said axle (14), the improvement comprising:

means (34) for connecting said trunnion shaft (30) to said frame (10) and permitting only pivotal movement of said trunnion shaft (30) about said longitudinal trunnion axis (32);

a resisting member (42) rigidly securely affixed to the end (43) of said trunnion shaft (30) and rotatable with and in response to rotation of said trunnion shaft (30); and

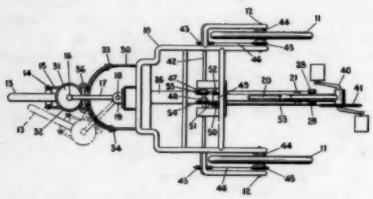
a resisting cap (44) having a resilient member (46) and being connected to one of said frame (10) and said connecting means (34) adjacent the end (43) of said trunnion shaft (30), said resilient member (46) being free from supporting the trunnion shaft (30) and engageable with said resisting member (42), said resilient member (46) being deformable in response to rotation of said resisting member (42) to resist rotation of said trunnion shaft (30).

4,408,776

THREE WHEEL VEHICLE

Travis M. Randolph, P.O. Box 505, and Charles P. Schreiner, P.O. Box 711, both of Saugatuck, Mich. 49453

Filed Apr. 6, 1981, Ser. No. 251,216
Int. Cl.³ B62K *5/04, 21/00*; B62M *1/02*
U.S. Cl. 280—261 **7 Claims**



1. A three wheel vehicle comprising:

a frame;

a pair of front wheel and axle assemblies rotatably mounted on either side near the front of said frame;

means on said frame for driving at least one of said front wheels;

a strut member having its proximal end pivotably mounted in a generally horizontal plane at the rear center of said frame with its distal end extending behind said frame;

a rear wheel fork rotatably mounted at the distal end of said strut member so as to be rotatable about a generally vertical axis;

a rear wheel and axle assembly rotatably mounted in said fork; and

steering means including means for rotating said fork about a generally vertical axis to turn said vehicle and means for simultaneously pivoting said strut member in a generally horizontal plane to displace said fork laterally with respect to the vehicle in a direction opposite the direction of turning the vehicle.

6. A three wheel vehicle according to claim **1** wherein said driving means comprises:

a rotatable pedal and drive sprocket assembly mounted at the front of said frame;

a transverse axle rotatably mounted on said frame;

a solid mounted sprocket on each end of said transverse axle;

a free-wheeling sprocket assembly mounted on each front wheel and axle assembly in chain engagement alignment with said transverse axle end sprockets, respectively;

a transmission assembly rotatably mounted on said frame having first, second and third solid mounted transmission sprockets, said first transmission sprocket being in chain engageable alignment with said drive sprocket;

a first free-wheeling sprocket mounted on said transverse axle in the forward drive orientation in chain engageable alignment with said third transmission sprocket;

a second free-wheeling sprocket mounted on said transverse axle in the reverse drive orientation in chain engageable alignment with said second transmission sprocket; and

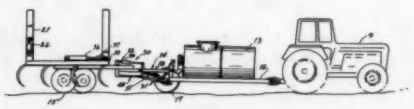
endless loop chains interconnecting each of said front wheel sprockets and said corresponding transverse axle end sprockets, said drive sprocket and said first transmission sprocket, said second transmission sprocket and said second free-wheeling sprocket, and said third transmission sprocket and said first free-wheeling sprocket.

4,408,777

HITCH MECHANISM

Lawrence K. Carrick, Spokane, Wash., assignor to Calkins Manufacturing Company, Spokane, Wash.

Filed Oct. 28, 1981, Ser. No. 315,976
Int. Cl.³ A01B *59/042*
U.S. Cl. 280—461 A **28 Claims**



1. A hitch assembly for pivotably connecting an elongated wheel supported towing tongue frame to a trailing implement frame having support means selectively operable to elevationally move the implement frame between a raised position and a lowered position, said assembly comprising:

an elongated link member adapted to be connected at one end to the tongue frame for pivotal motion about a first horizontal axis and at a remaining end to the implement frame for pivotal motion about a second horizontal axis;

first lock means responsive to the support means of the trailing implement frame, interconnecting the link member and one of the frames for locking the link member against pivotal motion about the first axis in response to operation of the support means to elevationally move the implement frame to the lowered position; and

second lock means operably connected to the support means of the trailing implement frame, interconnecting the link member and remaining frame for locking the link member against pivotal motion about the second axis in response to operation of the support means to elevationally move the implement frame to the raised position.

4,408,778

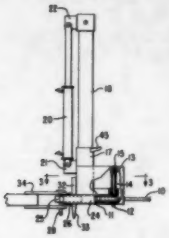
AUTOMATICALLY CONNECTING HITCH

Ronald G. Steuben, Box 191, Everly, Iowa 51338

Filed Oct. 26, 1981, Ser. No. 314,857
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—509 **8 Claims**

1. For hitching a tractor drawbar to a pulled implement having a tongue, means comprising connecting means adapted to be connected to said drawbar, pillar means on said connecting means, column means slidably disposed on said pillar means, jaws connected to said column means, at least a first jaw being pivotally mounted relative to said column means, said jaws being formed with notches adapted to embrace a pin

on said tongue, said jaws being normally opened but being engageable by means on said pillar means to force said first



mounted jaw closed when said column means is slidably moved to a pulling position.

4,408,779

SKI AND A SKI BINDING

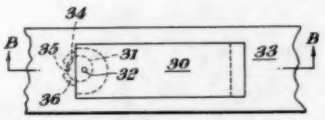
Robert J. Shekter, 912 Lea Dr., San Rafael, Calif. 94903

Filed Feb. 23, 1981, Ser. No. 237,087

Claims priority, application United Kingdom, Feb. 27, 1980, 8006570

Int. Cl.³ A63C *9/00*

U.S. Cl. 280—607 **14 Claims**



1. An assembly for detachably mounting a ski binding with a safety release system on a ski, which comprises

a ski plate having means for fixing said ski plate to a ski and having first and second portions coupled for relative movement between locking and release positions;

a binding plate having means for mounting a ski binding thereon and an aperture extending completely and vertically through said binding plate, said aperture having opposite ends which engage opposite ends of said ski plate with mating male and female connections when said portions are in said locking position; and

blocking means for releasably engaging and preventing relative movement of said first and second portions from said locking position.

4,408,780

BOUND BOOK AND METHOD OF MAKING SUCH BOOKS

Don E. Detterman; Ronald S. Danhoff, both of Willard, and William E. Wheeler, Plymouth, all of Ohio, assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Apr. 22, 1981, Ser. No. 256,552

Int. Cl.³ B42D *1/00*; B42C *9/00*

U.S. Cl. 281—15 R **19 Claims**

1. An improved book which is bound and ready to be covered or cased, said book comprising:

a pack of signatures at least some of which comprise a plurality of interleaved sheets, each signature having a closed side along the spine, and said pack having its entire spine and all the closed sides of sheets in each signature penetrated by a multiplicity of closely spaced, wide open notches which greatly enlarge the area of the spine to which adhesive may be applied;

and a wrap-around coating of adhesive which covers the entire spine area including the faces of the notches, the spine between the notches, and the front and back surfaces of the pack between and immediately adjacent the notches, said wrap-around coating of adhesive consisting of thin coats which are on the front and back surfaces of

the pack and extend into the notches, each said thin coat having a thick bead along its margin remote from the notches, and a thick coat which is on the faces of the notches and the spine between the notches, said thin coats and said thick coat being amalgamated in the notches.

4,408,781

RECORDING MATERIALS

Shojiro Watanabe, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 23, 1981, Ser. No. 314,341

Claims priority, application Japan, Oct. 24, 1980, 55-149132; Aug. 12, 1981, 56-126161

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **21 Claims**

1. A recording material comprising a base and a developer composition comprising (1) a phenolic compound selected from a bisphenol compound and a phenolic resin, (2) acid-treated activated clay, and (3) a polyalkylene oxide compound in an amount of from 0.2 to 5 wt%, based on the weight of the acid-treated activated clay, applied to said base.

4,408,782

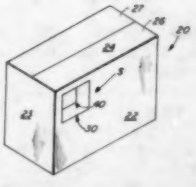
GRAPHIC MEANS AND METHOD FOR MAXIMIZING UTILIZATION OF CARGO SPACE

Edward L. Condon, Oak Park, Ill., assignor to Merriam, Marshall & Bicknell, Chicago, Ill., part interest

Filed Jan. 19, 1981, Ser. No. 226,198

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—70 **27 Claims**



1. The method of loading cargo elements in a cargo receiving space so that the number of cargo elements loaded in said space is substantially maximized, said cargo elements all having substantially the same dimensions, said method comprising the steps of determining the loading pattern which will substantially maximize the number of cargo elements in said cargo receiving space, applying the same graphic means to each of said cargo elements which means provides graphic instructions to a loader for loading said cargo elements in said space in said predetermined pattern, and loading said cargo elements in said

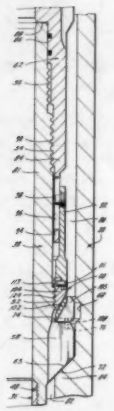
cargo space in accordance with the instructions provided by said graphic means.

4,408,783

HOLDDOWN APPARATUS

David L. Gruller, Houston, Tex., assignor to Smith International Inc., Newport Beach, Calif.

Filed Dec. 22, 1980, Ser. No. 219,252
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—3 **16 Claims**



1. A well apparatus for preventing axial movement of a hanger within a wellhead, the hanger having a shoulder supported by a seat in the bore of the head, the shoulder having an upper annular surface, the head having a holddown groove in the wall of the bore spaced above the seat, comprising:

expansible means including a latch ring radially slidably disposed on an upper annular surface of said hanger shoulder adjacent said holddown groove for expanding into locking engagement with such holddown groove of the head, said latch ring and said holddown groove having abutting shoulders which prevent relative axial motion therebetween when said latch ring engages said groove, said latch ring having a bevelled inside diametral surface;

cam means including a locking ring threadedly connected to said hanger with first threaded means and having a bevelled outside diametral surface shaped correlatively to said bevelled surface of said latch ring and in axially slidable engagement therewith for camming said latch ring radially outwardly into locking engagement with the holddown groove of the head when the first threaded means are made up; and

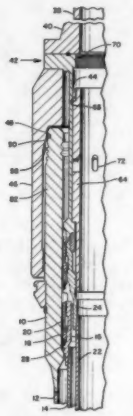
actuation means for actuating said locking ring into camming engagement with said latch ring, said actuation means including a tubular body threadedly connected to the hanger above said locking ring with second threaded means, said second threaded means being opposite-handed to said first threaded means; a torque sleeve telescopically slidably disposed on said body, there being an axial lost motion connection between said sleeve and said body which permits limited relative axial movement of said sleeve and said body but prevents relative motion therebetween; and shear means releasably connecting said sleeve to said locking ring, so that when said body is rotated so as to make up said first threaded means to actuate said latch ring, said second threaded means are loosened so as to disconnect said body from said hanger whereby said expansible means engages the head to prevent the axial movement of the hanger within the head.

4,408,784

PRODUCTION CASING TIEBACK CONNECTOR ASSEMBLY

Larry E. Reimert, Thousand Oaks, Calif., assignor to Vetco, Inc., Calif.

Filed Mar. 6, 1981, Ser. No. 241,187
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—24 **11 Claims**



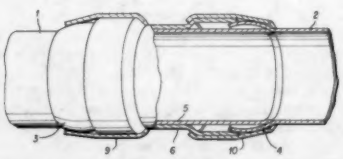
1. A connector assembly for tying back a subsea wellhead to a tensioned leg platform comprising: a casing hanger supported and sealed within the wellhead, said hanger having a sealing surface; a connector comprising a tieback joint and a guiding means for limiting deflection; said tieback joint comprising a vertically elongated hollow cylinder rigidly connected at its upper end to said guiding means, the lower portion of said cylinder having an outside diameter less than the inside diameter of the wellhead, and having a sealing surface; said guiding means comprising means interacting with the wellhead for limiting angular deflection of said tieback joint with respect to the wellhead; a circumferential seal located between the sealing surfaces of said casing hanger and said tieback joint; and means for axially preloading said seal between said casing hanger and said tieback joint.

4,408,785

ENGINE VIBRATION FILTRATION SYSTEM

Andre Legros, Marly le Roi, and Andre Chalesle, Paris, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 24, 1981, Ser. No. 277,041
Claims priority, application France, Jun. 27, 1980, 80 14349; May 12, 1981, 81 09393
Int. Cl.³ F16L *55/04, 27/04*
U.S. Cl. 285—49 **5 Claims**



1. A pipe joint for filtering vibrations produced by an internal combustion engine comprising:

an exhaust pipe assembly connected to said engine and which further comprises first and second pipes having first

and second adjacent end portions, each of said end portions forming a spherical member:

a connecting mechanism interconnecting said first and second end portions, wherein said connecting mechanism further comprises;

an internal cylindrical element having first and second beveled end portions disposed, respectively, within said spherical members of said first and second end portions;

a second external element mounted on a central portion of said cylindrical element and having first and second opposite ends forming sealing portions sealingly engaging external surface portions, respectively, of said spherical members of said first and second end portions;

a ring member mounted on said cylindrical element between said cylindrical element and a portion of said second element; and

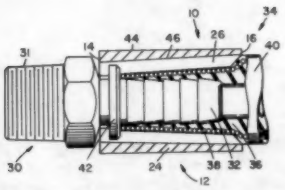
first and second envelope members engaging and interconnecting, respectively, said first and second spherical members and said opposite ends of said second element for holding the pipe joint in place.

4,408,786

FERRULE, COUPLING AND COUPLING PROCESS

Robert E. Stuemky, Elizabeth, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Feb. 26, 1982, Ser. No. 352,987
Int. Cl.³ F16L *33/20*
U.S. Cl. 285—256 **6 Claims**



1. In a deformable ferrule for use in coupling hose and of the type having a sleeve-type body with an outer surface, an inner surface, a fitting end and a hose end, the improvement comprising:

the sleeve-type body which has a sidewall portion that decreases in thickness going longitudinally of the body toward the hose end and whereupon deformation of the body when coupling hose, the outer surface has a generally cylindrical shape and the inner surface juxtaposed said sidewall portion has generally a frustoconical shape; and

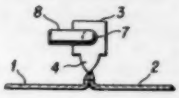
a plurality of generally parallel and spaced apart ribs extending from the inner surface and generally longitudinally oriented with the body, whereupon deformation of the body, the ribs are generally oriented as frustoconical elements of a cone where the circumferential spacing between ribs near the fitting end is reduced and becomes smaller than the circumferential spacing near the hose end.

4,408,787

SYSTEM FOR CONNECTING THE EDGE AREAS OF THIN-WALLED BODIES

Günter Petz, Flachslander St. 8, D 8500 Nürnberg, Fed. Rep. of Germany

Filed Oct. 21, 1980, Ser. No. 199,345
Claims priority, application Switzerland, Jan. 28, 1980, 641/80
Int. Cl.³ F16L *23/00*
U.S. Cl. 285—305 **16 Claims**



1. A system for connecting adjacent thin-walled bodies to each other comprising:

(a) each body including a bent edge area disposed transversely thereto;

(b) a plurality of staggered notch portions having apertures therethrough carried by each bent edge area for engagement with a plurality of corresponding staggered notch portions having apertures therethrough carried by the adjacent bent edge area, with the notch portions of both bent edge areas being configured for interlaced engagement with each other at free ends thereof;

(c) when the corresponding notch portions are in interlaced engagement with each other, the apertures are disposed in coaxial alignment, with the notch portions extending in a row successively to each other and the joined bodies define an interior joint side and an exterior joint side, wherein:

i. the notch portions are disposed on and visible only from the interior joint side; and

ii. the exterior joint side presents a linear joint defined by abutting portions of the bent edge areas; and

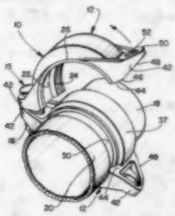
(d) an elongate member for insertion through the aligned apertures to secure the bodies together.

4,408,788

HINGEABLE SPLIT PIPE COLLAR

John A. Beukema, Whitinsville, Mass., assignor to Grinnell Fire Protection Systems Company, Inc., Cranston, R.I.

Filed Sep. 23, 1981, Ser. No. 305,030
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—419 **5 Claims**



1. A split collar for use with pipe and the like comprising a pair of opposed collar halves the inner surfaces of which cooperate to define a substantially circular opening having a central axis and an axial plane which contains said axis, outwardly extending flanges at each end of each of said halves, each of said flanges having a substantially flat inner surface which abuts the adjacent inner flange surface of the opposite half along a radial plane extending radially outwardly from said circular opening and substantially normal to said axial plane

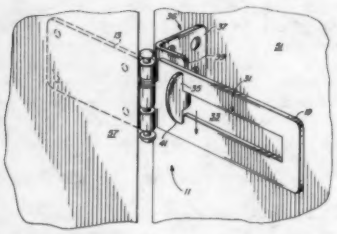
and which then diverges with respect to the opposite flange inner surface, aligned holes in said adjacent flanges, fastening means extending through said holes and substantially parallel to said axial plane operable to clamp said abutting inner surfaces of said adjacent flanges against each other to maintain said halves in assembled relation, said holes having substantial clearance inwardly and outwardly of said fastening means in a direction generally normal to said axial plane, the point at which said inner flange surfaces commence to diverge being located at least as close to said circular opening as the innermost edges of the adjacent fastening means in a direction substantially normal to said axial plane, whereby when one of said fastening means is completely removed, said halves may be swung outwardly with respect to each other without loosening the other fastening means, said outward swinging motion taking place substantially along a fulcrum located at the point where the inner surfaces of said still connected flanges commence to diverge.

4,408,789

SAFETY LATCH FOR IN SWINGING DOORS

Elbrige H. Miller, 1254 S. Florida Ave., Rockledge, Fla. 32955

Filed Feb. 23, 1981, Ser. No. 236,810
Int. Cl.³ E05C *17/16*
U.S. Cl. 292—268 **4 Claims**



1. A safety latch to be attached to a door and a jamb having an inner face for selectively locking the door in a closed position, permitting the door to open a predetermined angular displacement, or permitting the door to open freely, comprising:

a jamb plate attached to the inner face of the jamb and having a hollow cylindrical end portion protruding from the jamb a predetermined distance;

a pivotable bar having a tubular end portion concentrically juxtaposed to the hollow cylindrical end portion of the jamb plate, the pivotable bar also having a longitudinally disposed T-shaped slot with a first portion of predetermined width and a contiguous second portion of substantially larger width than the first portion said pivotable bar having a barrier defined by the contiguous first and second portions of the slot;

a pin disposed through the hollow cylindrical end portion of the jamb plate and the tubular end portion of the pivotable bar, said pin being a predetermined amount longer than the combined lengths of the hollow cylindrical end portion of the jamb plate and the tubular end portion of the pivotable bar, whereby the pivotable bar can pivot on the pin and can be displaced vertically relative to the jamb plate;

means disposed about the pin for vertically biasing the tubular end portion of the pivotable bar against the cylindrical end portion of the jamb plate; and

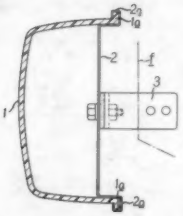
a bracket having a base portion secured to an edge of the door, a normal portion substantially perpendicular to the base portion, and a projecting portion substantially perpendicular to the normal portion, but disposed in a direction opposite the base portion, said projecting portion having a stem with a width slightly smaller than the width of the first portion of the slot, and a flared portion having a width greater than the width of the stem, but smaller than the width of the second portion of the slot, said flared portion having a substantially smooth contour throughout except at the point where the flared portion joins the stem, at which point there is an abrupt change of contour, whereby as the second portion of the T-shaped slot on the pivotable bar is rotated into contact with the flared portion, the smooth contour acts as a cam surface to raise the pivotable bar against the means for biasing, until the second portion of the T-shaped slot passes the abrupt change of contour where the flared portion meets the stem, and the biasing means forces the pivotable bar downwards against the stem so that the stem portion abuts against the barrier thereby providing a locking function when the door is closed; and whereby as the pivotable bar is displaced vertically, the stem can slide along the first portion of the T-shaped slot as the door is opened.

4,408,790

SHOCK-ABSORBING BUMPER FOR VEHICLES

Nobuyoshi Shimoda, Tokyo, and Michiyoshi Hagino, Urawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,499
Claims priority, application Japan, Feb. 22, 1980, 55-20488
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—122 **7 Claims**



1. A shock absorbing bumper comprising:

a bumper face member formed of a synthetic resin in the shape of a beam with both longitudinal end portions bent in substantially the same direction, said bumper face member having a channel-shaped cross section opening sidewardly with upper and lower edges thereof directed substantially rearwardly;

outwardly extending flanges being formed along said upper and lower edges of said bumper face member over a length thereof substantially corresponding to the width of said vehicle body on which said shock absorbing bumper is mounted;

a back plate formed of metal, said back plate having upper and lower bent end portions formed to closely fit in said bumper face member with substantially the entire outer surface areas of said upper and lower bent end portions of said back plate being in surface contact with the inner surfaces of said upper and lower edges of said bumper face member; and

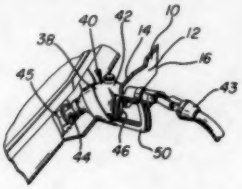
said upper and lower end portions of said back plate being provided with extensions for continuously tightly overlapping and seizing said outwardly extending flanges formed along said upper and lower edges of said bumper face member in operable association with said end portions of said back plate.

4,408,791

GAS PUMP LEVER HOOK MEMBER

James E. Griffin, and Lamar H. Griffin, both of 4746 Memphis St., Dallas, Tex. 75207

Filed Feb. 27, 1981, Ser. No. 238,847
Int. Cl.³ A47F 13/08
U.S. Cl. 294—1 R 5 Claims



1. A gas pump lever hooking member for use with a gas pump having a nozzle, a valve for regulating gas flow through the nozzle, a manually operable lever arm to open the valve, means for biasing the lever arm in a position whereby the valve is normally closed, and a fluid conveying handle disposed about the lever arm, said hooking member comprising:

an elongated generally rectangular member having first and second ends and opposite edge portions, at least one of said edge portions including means providing a hand grip; and one of said ends including a wedge shaped ice scraping surface formed thereon;

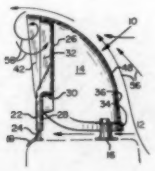
a pair of opposed claw portions formed at the other of said ends and spaced apart from each other a distance slightly greater than the combined width of the lever arm and the fluid conveying handle to define a slot sized to receive the lever arm and the fluid conveying handle whereby the lever arm is held in substantial proximity to the fluid conveying handle against the biasing means by said claw portions, said claw portions being releasably engageable with the lever arm and the fluid conveying handle at a point spaced apart from the end of the lever arm, and said claw portions forming reentrant edges of said slot to prevent said hooking member from falling off of said pump nozzle.

4,408,792

CAB-MOUNTED FAIRING

Patrick F. Sullivan, 3645 Glen Oak, Eugene, Oreg. 97405

Filed Mar. 19, 1981, Ser. No. 245,397
Int. Cl.³ B62D 35/00
U.S. Cl. 296—1 S 9 Claims



1. A fairing for mounting atop the cab of a vehicle such as a truck for improving the flow of air around the vehicle, comprising:

(a) an aerodynamic front member having a forwardly convex shape for reducing the turbulence of the flow of air around the top and sides of a vehicle, said front member including an arcuate, substantially horizontal forward lower edge extending rearwardly on each side, a rear edge extending transversely and side edges extending downward on each respective side of said front member, from said rear edge toward said forward lower edge, defining a concave interior of said front member; and

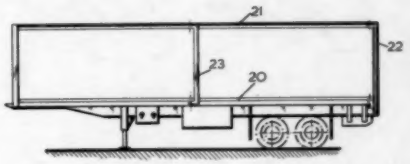
(b) substantially vertically-extending transverse rear panel means fixedly attached to said front member proximate said rear and side edges, for substantially blocking forward movement of air against the interior of said front member.

4,408,793

CURTAINSIDED VEHICLES

Edward G. Broadbent, Radnor Park Trading Estate, West Heath, Congleton, Cheshire, CW12 4QA, England

Filed Oct. 20, 1981, Ser. No. 313,146
Claims priority, application United Kingdom, Oct. 24, 1980, 8034421
Int. Cl.³ B62D 25/00
U.S. Cl. 296—181 5 Claims



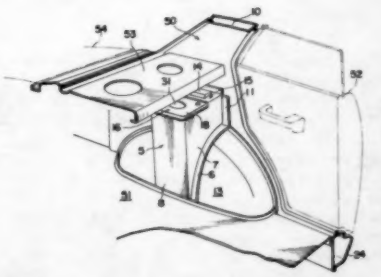
1. A curtainsided vehicle comprising a pillar between the roof and the bed of the vehicle, the pillar being carried by a pair of supports disposed normally to the pillar and pivoted respectively to a top rail and to the chassis of the vehicle, the pillar mounting a locking mechanism which secures the pillar in position, and which, when released, allows pivoting of the supports to move the pillar outboard of the vehicle bed.

4,408,794

SUPPORT COLUMN FOR AUTOMOBILE WHEEL SUSPENSION ASSEMBLY

Hayathugu Harasaki, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Nov. 4, 1981, Ser. No. 318,276
Claims priority, application Japan, Nov. 11, 1980, 55-159196
Int. Cl.³ B62D 25/08
U.S. Cl. 296—198 12 Claims



1. A support column for an automobile body structure for accommodating a wheel suspension assembly for a rear wheel, the automobile body structure having a wheel housing generally encircling halfway the perimeter of the rear wheel, the body structure including an inner panel extending above the wheel housing, said support column comprising:

a column structure for being rigidly mounted on the wheel housing and projecting generally upwardly therefrom in a

direction away from the wheel, said column structure including a major upright wall and a pair of opposite side walls protruding from respective opposite side edges of said major upright wall so as to terminate in rigid and non-separable contact with a portion of the inner panel above the wheel housing;

a plate means for connecting the column structure to the inner panel, said plate means connecting said side walls together in spaced relation at a position adjacent the inner panel and on one side of said side walls opposite to the wheel housing; and

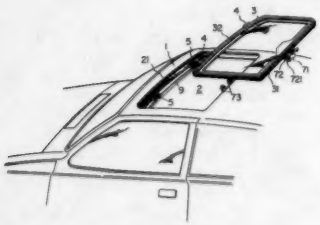
a support plate means having a bracket portion rigidly mounted on said column structure for connection with the suspension assembly and a brace portion having an end for rigid contact with the inner panel, extending downwardly from said bracket portion so as to diverge away from said major upright wall and terminating at said end.

4,408,795

HINGE DEVICE FOR A DETACHABLE ROOF PANEL IN AN AUTOMOBILE

Masaaki Saitoh, Wakou, and Michitada Kameoka, Musashino, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,636
Int. Cl.³ B60J 7/18
U.S. Cl. 296—218 **4 Claims**



1. A hinge device for a detachably attachable type roof plate in a vehicle, comprising:

(a) a roof of the vehicle having an opening formed in one part of it, said opening having an inner peripheral rim;

(b) a roof plate of a size to be snugly fitted in said opening of said roof;

(c) at least one hinge member provided on the front edge of said roof plate;

(d) latching means provided on the rear edge of said roof plate;

(e) a receiving member provided on said inner peripheral rim of said roof opening to receive into a slot formed therein said hinge member at a position corresponding each other; and

(f) engaging means to be engaged with said latching means on said roof plate in a disengageable manner,

a plurality of channels, for retaining therein dust, and other foreign matter, formed in the lower surface of said hinge member receiving slot of said receiving member in the direction substantially along the inserting and withdrawing direction of said hinge member.

4,408,796

MECHANISM FOR PROVIDING ANGULAR ADJUSTABILITY TO LEGREST OF RECLINER ONLY WHEN PROJECTED

Ned W. Mizelle, High Point, N.C., assignor to The Lane Company, Inc., Altavista, Va.

Filed Dec. 29, 1980, Ser. No. 220,859
Int. Cl.³ A47C 1/02
U.S. Cl. 297—85 **9 Claims**

1. For a legrest projecting and retracting means of the lazy tongs type having a four-bar linkage, an improvement for permitting a legrest mounted thereto to become angularly rockable, only when the projecting and retracting means is more projected than retracted,

said improvement comprising:

a legrest mounting bracket having means for securing a legrest thereto;

means pivotally securing said legrest mounting bracket to said four-bar linkage about a lateral pivot axis; and

control means active between said four bar linkage and said legrest mounting bracket to prevent pivoting of said legrest mounting bracket about said lateral pivot axis unless said projecting and retracting means is more projected than retracted;

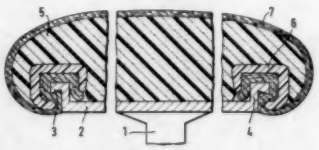
said control means comprising a lateral pin means provided on one of said legrest mounting bracket and said four-bar linkage and a cam slot means receiving said lateral pin means, said cam slot means being provided in the other of said legrest mounting bracket and said four-bar linkage.

4,408,797

FURNITURE ARTICLE WITH PADDING ATTACHED TO A SUPPORTING SHELL

Klaus Franck, Hanover; Werner Sauer, Wennigsen, and Herbert L. Wiesmann, Hameln, all of Fed. Rep. of Germany, assignors to Wilkhahn, Wilkening & Hahne GmbH & Co., Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 232,861
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004585
Int. Cl.³ A47C 31/02
U.S. Cl. 297—218 **20 Claims**



1. An article of furniture comprising a supporting means and a padding means adapted to be mounted on the supporting means, characterized in that the padding means includes a cushion member, a cover means for covering the cushion member, and a profile means having an outer surface embedded in the cushion member for clamping the padding means and cover means directly to the supporting means whereby the padding means and cover means are clamped to the supporting

means by said profile means without additional retaining means.

4,408,798

VEHICLE SEAT STRUCTURE FOR TWO-DOOR TYPE VEHICLE

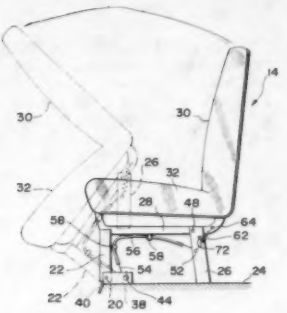
Yoichi Mizushima, Yokohama; Taketoshi Hosonaga, Tokyo; Takashi Murakami, Yokohama, and Nikio Ujiie, Akishima, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Tachikawa Spring Co., Ltd., Akishima, both of, Japan

Filed Sep. 30, 1980, Ser. No. 192,288

Claims priority, application Japan, Oct. 3, 1980, 54-128985

Int. Cl.³ A47C *27/00*

U.S. Cl. 297—326 **12 Claims**



1. A vehicle seat structure comprising:

a seat mounted on a vehicle floor;

a front and rear legs for supporting said seat on said vehicle floor;

first pivot means for pivotably connecting said front legs on said vehicle floor;

second pivot means for pivotably connecting said rear legs with said seat so that said rear legs are rotatably secured to said seat with said second pivot means at the top thereof;

actuator means for moving said rear legs to fold relative to said second pivot means below the seat according to inclination of said seat about said first pivot means, said actuator means being provided along front leg and lower portion of said seat and secured to said front leg and lower portion of said seat by guides fixed thereto, and said actuator means being responsive to dimensional variation of said rear legs and said floor panel, and

returning means for returning said rear legs to an initial position responsive to returning of the seat to normal position.

4,408,799

INFINITELY VARIABLE SEAT BACK RECLINER

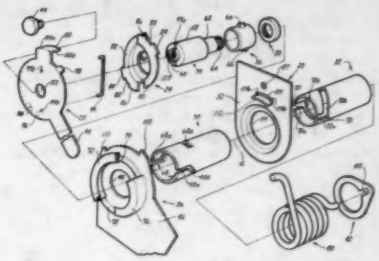
James A. Bowman, Georgetown, Ky., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jun. 25, 1981, Ser. No. 277,416

Int. Cl.³ A47C *1/027*

U.S. Cl. 297—361 **23 Claims**

1. In a seat having a cushion and a back which are relatively angularly positionable about a hinge axis, an infinitely variable mechanism which, by means of an operating lever, relatively positions the back and cushion about the hinge axis to any angular position within a range of angular positions and which for any angular position to which the two have been positioned by the operating lever disallows the two from being further angularly displaced except by subsequent operation of the lever, said mechanism comprising wedge means operatively coupled between the back and the cushion comprising a pair of wedging members which, at any relative angular position between the back and cushion within said range, in response to application of an external torque to the back and cushion about the hinge axis other than via the operating lever, wedge together to disallow angular displacement between the back and cushion, and means operatively coupling the lever, the wedge means, the seat cushion and the seat back such that operation of



the lever is effective to freely angularly position the back and cushion about the hinge axis without the two wedging members disallowing the relative rotation.

4,408,800

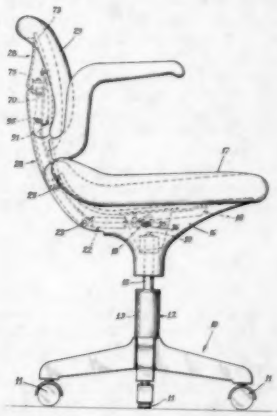
OFFICE CHAIRS

Robert L. Knapp, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Jun. 11, 1980, Ser. No. 158,433

Int. Cl.³ A47C *3/00, 1/02, 1/022*

U.S. Cl. 297—285 **8 Claims**



1. In an office chair comprising a base adapted to support the chair; seating means including a seat support frame above said base; and a backrest assembly for supporting the back of an occupant of said chair and pivotally mounted to said seat support frame for rotation about a horizontal axis, the improvement comprising: first pneumatic cylinder means interconnecting said seat support frame with said base of said chair for adjusting the height of said seat support frame and including a first actuator valve; second pneumatic cylinder means interconnected between said backrest assembly and said seat support frame for adjusting said backrest in postural attitude and including a second actuator valve; and an actuating mechanism carried by said seat support frame for selectively independently actuating said first and second pneumatic cylinder means and including a cam member mounted in said seat support frame for rotation about a horizontal axis transverse of said chair, a rotatable shaft connected to said cam and journalled in said frame and accessible by said occupant, said cam member having first and second cam surfaces for selectively engaging and actuating said first and second actuator valves of said first and second pneumatic cylinder means respectively when said shaft is rotated respectively in a first angular direc-

tion and a second angular direction counter to said first angular direction.

4,408,801

ELEVATED SWIVEL CHAIR HAVING A MOVABLE FOOT SUPPORT FOR LOCKING THE CHAIR AGAINST SWIVELING MOTION

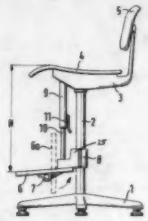
Hans J. Edel, Wittekindallee 17, D-4950 Minden/West, and Helmut Hornung, Karolingerstrasse 9, D-6057 Dietzenbach/West, both of Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,305

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024920

Int. Cl.³ A47C *7/50*

U.S. Cl. 297—433 **14 Claims**



1. In a swivel chair of the type comprising a base, a tubular pillar on said base, a seat supported by said pillar at an elevated position above said base for swiveling motion relative to said base, and a foot support disposed between said base and said seat for aiding a user of the chair to ascend to the elevated seat, the improvement wherein a bracket is mounted on said pillar between said base and said seat for swinging motion around said pillar, said foot support being carried by said bracket, and stop means disposed adjacent said bracket and responsive to foot pressure applied to said foot support in excess of a predetermined amount for preventing the swinging motion of said bracket and the foot support carried thereby relative to said pillar.

4,408,802

ADJUSTABLE VEHICLE SEAT

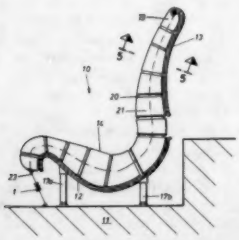
Heinz-Dieter Adomeit, Berlin, and Volkmar Schulz, Coburg, both of Fed. Rep. of Germany, assignors to Heinz-Dieter Adomeit, Berlin and Metallwerk Max Brose GmbH & Co., Coburg, both of, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,664

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3018323

Int. Cl.³ A47C *1/02, 7/02*

U.S. Cl. 297—452 **3 Claims**



1. In an adjustable vehicle seat adapted to be installed in a longitudinal vehicle chassis, and including a seat frame, a back frame, and an upholstery disposed on said frames, and wherein said seat frame is adjustable in inclination and along the longitudinal direction independently of said back frame, and said seat frame together with said back frame are adjustable along said longitudinal direction, and are adjustable in height with respect to said vehicle chassis, and said back frame is adjustable in inclination with respect to said seat frame, the improvement comprising

said seat frame being adjustable in height independently of said back frame with respect to said vehicle chassis,

said back frame being adjustable independently of said seat frame in the longitudinal direction, and in height with respect to said vehicle chassis and

said upholstery being longitudinally slidably guidable with respect to said frames.

4,408,803

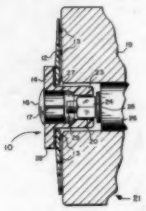
HUB ASSEMBLY FOR ROLLER SKATES

James P. Green, and Paul L. Cobaris, both of 4749 Marbello Blvd., Orlando, Fla. 32805

Filed May 4, 1981, Ser. No. 260,295

Int. Cl.³ A63C *17/22*

U.S. Cl. 301—5.7 **14 Claims**



1. A hub assembly for attachment to a roller skate wheel which has a hexagonal axle nut for retaining wheel bearings comprising:

hub means having a cylindrical body portion and an outer flange portion, the inner end of said body portion having a hexagonal opening therein in which said opening forms a force fit over the hexagonal axle nut, said hub means adapted to be installed on he hexagonal axle nut so as to provide a space between said flanged portion and the outside face of the skate wheel;

flat ring means having an outside diameter less than the diameter of the skate wheel, and an inside diameter slightly greater than the diameter of said body portion of said hub means, said flat ring means having a plurality of projections from an inner face thereof, said flat ring means installed on said body portion of said hub in said space between said flange portion and the outside face of the skate wheel with said projections in frictional contact with the outside face such that said flat ring means is free to rotate with respect to said hub means whereby said frictional contact of said projections causes said flat ring means to rotate when the skate wheel is turning in use; and

whereby said hub means and said flat ring means act to protect the wheel bearings from intrusion of dirt.

4,408,804

COMPOSITE WHEEL COVER

Claude J. Marshall, Jr., Ann Arbor, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

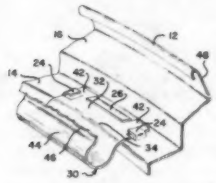
Continuation of Ser. No. 251,674, Apr. 6, 1981, abandoned, which is a continuation of Ser. No. 93,427, Nov. 13, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 323,528

Int. Cl.³ B60B *7/04, 7/06*

U.S. Cl. 301—37 R **1 Claim**

1. A wheel cover disposed on the axial outer face of a vehicle wheel having a wheel flange, said wheel cover being of the

composite type comprising: an annular ring of one type material; said annular ring having a rim portion disposed in a plane substantially parallel to said wheel flange; said rim portion having formed on the outer surface thereof a plurality of receptacles each of which receive retention means of another material for mechanically interlocking said retention means to said annular ring and said retention means being engageable with said wheel flange for mounting said wheel cover on said vehicle wheel; said annular ring is formed from a strip material into a closed loop; the ends of said closed loop are mechanically interlocked one to the other; said ends of said closed loop are interlocked one to each other by spot welding; said strip material is galvanized steel; said retention means is a retention clip; said retention clip is formed from annealed spring steel; said annular ring has formed thereon a radially projecting annular lip, an annular ornamental cover of a different material than said annular ring and said retention means being mechanically interlocked to said annular ring by the deforming of said annular ornamental cover about said radially projecting lip; said ornamental cover is formed from stainless steel; said receptacle including two opposed radially outwardly extending and circumferentially facing tabs and a radially outwardly extending and axially inwardly facing stop tab all formed by upsetting said tab material from said annular ring; said spring steel retention clip having an arcuate base portion whose arc corresponds generally to the arc of the outer surface of said annular ring; said spring steel retention clips having at least one locking tab formed by upsetting the axially inner edge of said locking tab in a radially inwardly direction; said base portion of said spring steel retention clip being received by said receptacle such that said locking tab thereof is captured and guided by one of said opposed tabs by way of said locking tab being biasingly registered with one of the openings formed in said rim portion resulting from the forming of said opposed tabs and said stop tab capturing said base portion of said spring steel retention clip along the axially outward edge thereof.



4,408,805

CONTROL VALVE ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

Roy E. Edwards, Warley, and Anthony G. Price, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

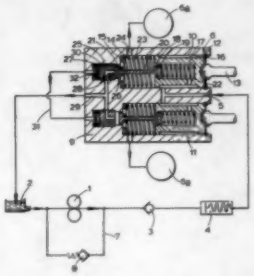
Filed May 28, 1981, Ser. No. 268,006

Claims priority, application United Kingdom, Jun. 17, 1980, 8019806

Int. Cl.³ B60T *13/00*

U.S. Cl. 303—6 A **7 Claims**

1. A dual hydraulic braking system for a vehicle comprising a source of high pressure hydraulic fluid, a reservoir for fluid, brakes on wheels on opposite sides of the vehicle, a control valve assembly for controlling the supply of high pressure fluid to said brakes, and independently operable pedals for operating said control valve assembly to cause fluid under pressure to be supplied to the respective brakes on opposite sides of the vehicle, said control valve assembly comprising a housing having separate bores, a pedal-operated piston working in each of said bores, pressure spaces defined by said bores in advance of said pistons, a normally closed inlet valve associated with each of said pistons for isolating said source from said pressure space, a normally open exhaust valve associated with each of said pistons for providing communication between said pressure space and said reservoir, a pair of outlets for connecting said pressure spaces to said brakes on opposite sides of the vehicle, each of said pistons being movable in a brake-applying direction to close a respective one of said exhaust valves and thereafter to open a respective one of said inlet valves whereby fluid under pressure is supplied to a respective one of said pressure spaces, and a transfer connection which is adapted to interconnect said pressure spaces when said exhaust valves are open and which ensures that, when both said pedals are operated simultaneously, both said inlet valves can only open substantially simultaneously following closure of both said exhaust valves.



4,408,806

ARTICULATION DEVICE FOR CONNECTING A MEMBER TO A SHAFT SO THAT THE MEMBER PIVOTS AND SLIDES RELATIVE TO THE SHAFT

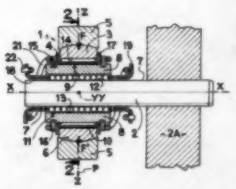
Meidul Orain, Conflans-Sainte-Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Jan. 28, 1981, Ser. No. 228,932

Claims priority, application France, Feb. 15, 1980, 80 03355

Int. Cl.³ F16C *19/48, 25/08*

U.S. Cl. 308—6 R **4 Claims**



1. An articulation device allowing a pivotal and sliding motion of a member on a shaft having an axis, said device comprising said shaft which defines two axially extending raceways which face in two substantially opposed directions radially of said axis for taking loads exerted on said shaft in two privileged directions, said shaft further defining two cylindrical outer surfaces which are interposed between and interconnect said two raceways, said member which defines a bore, an outer ring arrangement of rolling members which have a linear contact and are parallel to the axis of the shaft, an intermediate support means for said roling members and comprising two distinct second members in combination with said two cylindrical surfaces of the shaft, each second member having substantially the shape of a segment of a cylinder coaxial with the shaft and defining a groove, said ring arrangement of rolling members being interposed between said bore and the two second members, and inner rows of rolling members which are perpendicular to said axis, the inner rows of rolling members being interposed between and having linear contact with a

respective one of said grooves in said second members and a respective one of said two axially extending raceways on the shaft, and the radius of said cylindrical surfaces of the shaft being slightly less than the radius of the cylindrical surface of the second members, whereby said cylindrical surfaces of the second members constitute raceways for the ring arrangement of rolling members and said two cylindrical surfaces of the shaft merely guide the ring arrangement of rolling members.

4,408,807

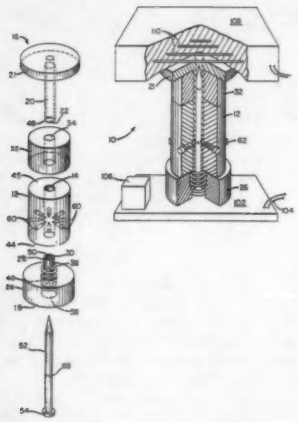
COMPRESSION MOLDING OF POROUS RETAINERS

Herbert B. Singer, Randolph, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 11, 1981, Ser. No. 233,396

Int. Cl.³ F16C *33/44;* B28B *1/08*

U.S. Cl. 308—187 **9 Claims**



1. A method for direct molding of a ball bearing retainer comprising the steps of:

filling a ball bearing retainer mold with a predetermined quantity of polyamide-imide powder;

compressing said powder in said mold and applying an elevated temperature thereto; and

subsequently curing said compressed powder at a curing temperature for a predetermined time interval to form from the powder a porous retainer having a plurality of ball bearing pockets with the retainer pores open to the surface in the pockets to promote the flow of an impregnating lubricant across said surface.

4,408,808

RELUBRICATABLE DOUBLE ROW BEARING

Jerry L. Redmann, Jr., Sparta, and Gerald W. Gurney, Ada, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Jul. 30, 1981, Ser. No. 288,317

Int. Cl.³ F16C *33/66, 19/08*

U.S. Cl. 308—187 **32 Claims**

1. In a relubricatable bearing having:

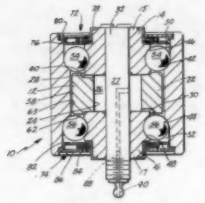
an outer race member having an inner wall defining two outer races, said inner wall including a portion between said outer races;

first and second inner race members defining first and second inner races, respectively, said first and second inner race members being located within said outer race member;

a first row of balls positioned between and engaging both said outer race and said first inner race;

a second row of balls positioned between and engaging both said outer race and said second inner race, the improvement comprising:

a spacer positioned between and engaging both said first and second inner race members, said spacer comprising a body having an inner wall defining a lubricant reservoir, an outer wall adjacent said inner wall portion between said outer races of said outer race member, and first and second faces abutting said first and second inner race members, respectively, said first face defining at least one first groove extending along said first face from said reservoir to said first row of balls, said second face defining at least one second groove extending along said second face from said reservoir to said second row of balls, whereby lubricant under pressure in said reservoir will migrate through said first and second grooves between said spacer and said inner race members to lubricate said first and second rows of balls, respectively.



4,408,809

SEAL, ESPECIALLY FOR WHEEL BEARING ARRANGEMENTS FOR VEHICLES

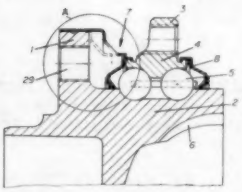
Lothar Walter, Schweinfurt; Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Eussenheim; Heinz Kiener, Waigolshausen, and Wolfgang Friedrich, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Industries, Inc., King of Prussia, Pa.

Filed Mar. 27, 1981, Ser. No. 248,277

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012421

Int. Cl.³ F16C *33/00, 33/76*

U.S. Cl. 308—187.1 **12 Claims**



1. In a bearing having an inner bearing ring with a first radially outwardly directed flange, an outer bearing ring with a second radially outwardly directed flange, a plurality of rolling bodies positioned to roll between said inner and outer rings, a seal affixed to said outer ring and having a free edge slidably engaging said inner ring, and a cover mounted to cover said seal; the improvement wherein said cover has a first portion mounted on said first flange, a free edge portion spaced from said first portion and extending to lie radially outward of an outer shoulder of said outer ring to form a narrow gap therebetween, and an intermediate portion between said first portion and edge portion defining a lubricant accumulation space, said intermediate portion having an axially extending sleeve-shaped section affixed to said first portion, and an angled section between said sleeve shaped section and free edge portion, said angle section extending in a substantially radially

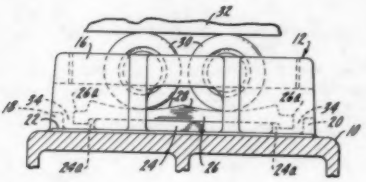
inwardly direction from said sleeve-shaped section toward said portion of said outer ring.

4,408,810

RESILIENT SIDE BEARING

Robert P. Geyer, Palatine, Ill., assignor to Standard Car Truck Company, Park Ridge, Ill.

Filed May 27, 1982, Ser. No. 382,766
Int. Cl.³ F16C *19/00*; B61F *5/14*
U.S. Cl. 308—226 **10 Claims**



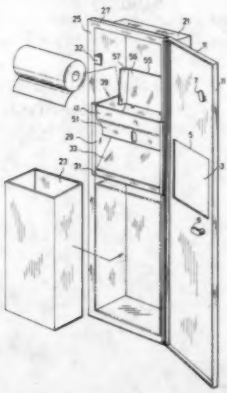
1. A constant contact side bearing adapted to be positioned on a railroad car truck bolster and in constant contact with the underside of the car body for retarding turning movement of the car truck relative to the car body, said side bearing including a housing adapted to be positioned on the bolster, a pair of rollers mounted within said housing for contact with the underside of a car body, said rollers being arranged with their axes parallel to the longitudinal axis of the bolster, a contoured bearing plate positioned within said housing and supporting said rollers, an elastomeric pad positioned within said housing beneath and supporting said bearing plate, said contoured bearing plate and elastomeric pad providing resistance to rolling movement of said rollers responsive to relative rotation between the car truck bolster and car body underside.

4,408,811

WALL MOUNTED PAPER TOWEL HANDLING UNIT

Frank Richardson, Georgetown, and Allan H. Campbell, Burlington, both of Canada, assignors to Twin-Cee Limited, Georgetown, Canada

Filed Nov. 10, 1980, Ser. No. 205,463
Int. Cl.³ B65H *19/00*
U.S. Cl. 312—37 **10 Claims**



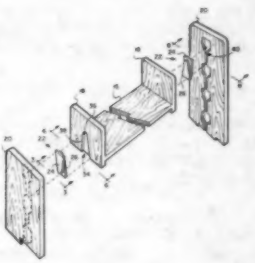
1. A tamper resistant towel dispenser and waste unit for mounting to a wall and comprising a wall box and a forward door for opening and closing the wall box, said wall box being provided with a towel cradle assembly, a towel dispensing cavity in the towel cradle assembly, a waste bin receiving region for receiving a waste bin which substantially fills the waste bin receiving region when inserted in the wall box, and an outwardly projecting box flange around the wall box; said door having a mouth which opens into the towel dispensing cavity in the wall box when the door is closed, an outer peripheral region adapted for mating with the box flange around the wall box and locking means for locking the door closed, the arrangement being such that when the waste bin is received within the wall box with the door closed, the waste bin which is sandwiched by the door in the wall box and the box flange and, the towel cradle assembly, support the door against the inward collapsing, and such that the box flange underlies the outer peripheral region of the door and the towel cradle assembly shields the door mouth at its periphery to substantially reduce leverage for outward prying of the door away from the wall box.

4,408,812

DISMOUNTABLE FURNITURE

John Krautwurst, 67 Ingram Dr., Toronto, Canada M6M 2L7

Continuation-in-part of Ser. No. 30,846, Apr. 17, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 172,554
Int. Cl.³ A47B *91/00*, *3/00*
U.S. Cl. 312—256 **12 Claims**



1. Dismountable furniture comprising; at least two vertical members;

a plurality of horizontal members;

a vertical end wall attached to each end of each said horizontal member;

a plurality of upwardly directed V-shaped recesses formed in inwardly facing surfaces of said vertical members;

a downwardly facing V-shaped recess formed in the outwardly facing surface of each said vertical end wall of each said horizontal member, and,

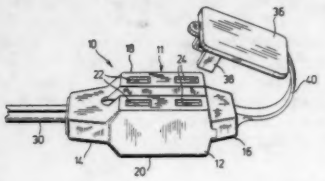
at least two joining members, each said joining member having two generally V-shaped locking portions, having inner and outer sides, and being integrally joined between their inner sides thereby locating said V-shaped locking members in spaced apart parallel planes, with their apices overlapping and extending in opposite directions, with one of said V-shaped locking members being dimensioned to be received in one of said V-shaped recesses in said vertical members, and the other of said V-shaped locking members being dimensioned to be received in said V-shaped recess of said vertical end walls, whereby said horizontal members may be supported between said vertical members, by interlocking engagement of said V-shaped locking members.

4,408,813

MULTIPLE OUTLET AND COVER THEREFOR

Rudolph Koehler, Willowdale, Canada, assignor to Noma Canada Ltd., Scarborough, Canada

Filed Sep. 4, 1981, Ser. No. 299,405
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—38 **7 Claims**



1. A cube tap comprising:

an insulating housing having a pair of generally opposed ends respectively defining the axial ends of said housing;

a pair of generally opposed side faces extending between said ends;

a plurality of electrical contacts contained within said housing;

inlet conductors secured to said housing at one axial end thereof and being electrically connected to said electrical contacts;

a pair of transversely spaced prong openings one said side face having a first pair of prong openings therein adjacent the one axial end of said housing and a second pair of prong openings adjacent the other axial end;

the other said side face having a pair of prong openings therein, said prong openings being adapted to receive the prongs of an electrical plug connector within said housing to contact said electrical contacts;

an insulating cover having a pair of tabs projecting from one side thereof, and

a flexible tether integrally connecting said cover to said cube tap at the axial end thereof remote from said inlet conductors, said tether permitting said tabs to engage in any said pair of prong openings,

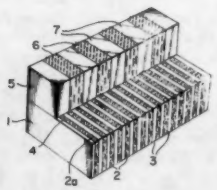
said tabs located on said cover such that when engaged in said second pair of prong openings said first pair of prong openings is uncovered, and when engaged in said first pair of prong openings said first and second pair of prong openings are covered.

4,408,814

ELECTRIC CONNECTOR OF PRESS-CONTACT HOLDING TYPE

Nogami Takashi, Tokyo, and Masuda Haruhiko, Hasuda, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,215
Claims priority, application Japan, Aug. 22, 1980, 55-115647
Int. Cl.³ H01R *4/00, 9/00*
U.S. Cl. 339—59 M **5 Claims**



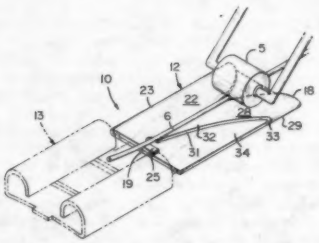
1. An elastomeric electric connector of the stratification type in the form of an alternately stratified body having a rectangular cross section formed of a plurality of layers of an electrically conductive rubber and a plurality of layers of an electrically insulating rubber bonded together and surrounded by the lateral surfaces each having a striped appearance made of the peripheral surfaces of the alternately stratified layers of the rubbers, in which a plurality of whisker-like upright projections of electrically conductive linear bodies are provided on at least one of the lateral surfaces of the striped appearance in the areas corresponding to the peripheral surfaces of the layers of the electrically conductive rubber.

4,408,815

HIGH COMPLIANCE ROLL-IN CHANNEL WIRE TERMINATION

Samuel W. Apicelli, Highspire, Pa., and Dimitry G. Grabbe, Lisbon Falls, Me., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 28, 1981, Ser. No. 315,833
Int. Cl.³ H01R *11/08*
U.S. Cl. 339—95 R **10 Claims**



1. An electrical connector of the type comprising a first end, a second end, and a wire-receiving channel extending inwardly from said first end toward said second end, said channel having opposed first and second edges which converge from said first end to a wire-contacting portion toward said second end, said opposed edges being spaced apart at said wire-contacting portion by a distance which is less than the diameter of a wire for which said device is intended, said wire being axially channeled in said slot, characterized in that

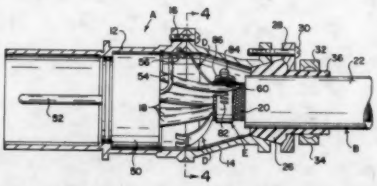
said connector comprises a plate-like member having generally parallel first and second bights where said member is folded against a base portion of said member to form respective first and second laps which define respective first and second edges of said wire-receiving channel.

4,408,816

TERMINATOR CONNECTOR FOR SHIELDED CABLES

George W. Knecht, Brooklyn, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 25, 1981, Ser. No. 324,811
Int. Cl.³ H01A *4/66*
U.S. Cl. 339—143 R **15 Claims**



1. A terminator connector for grounding a conductive shield on a cable to a housing comprising: a generally cylindrical base

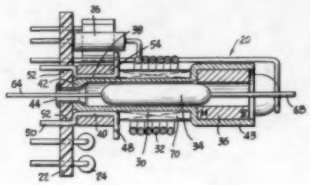
portion having a longitudinal axis, opposite circumferential edges and overlapping ends, and a plurality of spring fingers extending outwardly from one of said edges away from said axis in circumferentially-spaced relationship to one another, said base portion being clampable against a conductive cable shield and at least one of said fingers being engageable with a conductive housing at an end portion of the cable.

4,408,817

P. C. BOARD BOBBIN CONSTRUCTION

Donald J. Mattis, Norwalk, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jul. 22, 1981, Ser. No. 285,808
Int. Cl.³ H01R *13/70*
U.S. Cl. 339—147 R **15 Claims**



1. A P. C. board electrical component assembly comprising, in combination:

(a) a holder in the form of a cylindrical body adapted to support electrical entities,

(b) a terminal retainer sleeve fitted over one end of said cylindrical body,

(c) said retainer sleeve having aligned notches in both its ends and having an aligned internal groove connecting said notches and forming a U-shaped recess, and

(d) a terminal wire constituted as a piece separate and apart from said body and sleeve, said terminal wire having a rigid U-shaped portion, which is slidably received and disposed in said groove and notches and closely fits therein, said terminal wire being received in said recess with essentially a purely translational movement wherein the legs of the wire move essentially endwise during the receiving movement,

(e) said cylindrical body engaging the terminal wire and constituting a means for retaining the latter in said groove and notches,

(f) said terminal wire having an extremity terminal portion which is essentially parallel to the yoke part of the U-shaped portion, and which is adapted for insertion in an opening of a printed circuit board, and said wire being pre-formed.

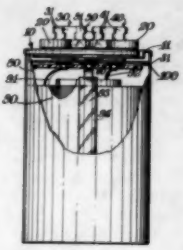
4,408,818

CAPACITOR COVER-TERMINAL ASSEMBLY

Paul M. Markarian, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Feb. 26, 1981, Ser. No. 238,314
Int. Cl.³ H01R *3/00*
U.S. Cl. 339—147 C **7 Claims**

1. A cover-terminal assembly for a multi-section capacitor comprising a round metal cover having a rim portion and three terminals mounted therein in a triangular array, each of said terminals having a plurality of flat blade portions and being located in an insulative bushing having a pentagonal shape, there being at least minimum safety distance between any blade portion of any one of said terminals and any blade portion of any other of said terminals and between any blade portion of any of said terminals and a vertical plane in which an edge of said cover lies, wherein each of said bushings has a curved edge that lies on an imaginary circle concentric with and smaller than the cover, two straight edges that form an apex pointing to the center of said cover and lying opposite said



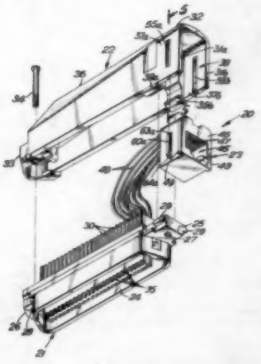
curved edge, and two straight edges parallel to each other and each joining an edge that forms said apex and said curved edge.

4,408,819

ELECTRICAL ADAPTER WITH SNAP-FITTED JACK AND HOOD

Ronald H. Guelden, Shreveport, La., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,497
Int. Cl.³ H01R *13/506, 27/02*
U.S. Cl. 339—154 A **10 Claims**



1. In an electrical telecommunications adatpter for coupling the terminating plug of a telephone set to contacts in turn coupled to the wires of a distribution cable, said adapter comprising:

(a) a longitudinally elongated electrical multi-pin connector horizontally disposed in its longitudinal direction, and the pins of which are adapted to be coupled with said contacts.

(b) a hood disposed over said connector and of transverse vertical cross-sectional upside down "U" shape so as to have an interior open at the bottom and to be enclosed by a top wall and transversely spaced resilient vertical sidewalls, all of said walls being portions of said hood which longitudinally extend to a forward end thereof to terminate at a front opening therefor of said shape; and

(c) a jack for receiving said plug in a passage formed in said jack, said jack including contacts at the rear of said passage for respectively engaging with contacts in said plug, and said jack also including a housing containing said passage and said contacts therein and having longitudinally extending vertical surface areas on transversely

opposite sides thereof, said housing being adapted to be disposed in the forward end of said hood at least partly to the rear of said opening with said surface areas of said housing being enclosed by said sidewalls of said hood;

the improvement in which:

(d) said jack housing has projections thereon which are adapted to be disposed within and above the bottom of said hood, rearward of said opening, and which extend transversely outward of said surface areas of said housing;

(e) said sidewalls of said hood have formed therein receptacles disposed above the hood's bottom and within which said projections are receivable; and

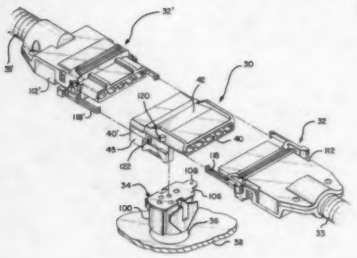
(f) said jack when separated from said hood is insertable therein by wedging said jack upward into said hood to produce a transverse resilient spreading of said hood's sidewalls until said projections have entered said receptacles and, thereafter, a resilient restoration of said sidewalls towards each other so as to produce a snap-fitting together of jack and hood.

4,408,820

ELECTRICAL TERMINALS FOR MODULAR WIRING SYSTEMS

Daniel G. Eaby, Mt. Joy; William B. Long, Camp Hill, and John R. Shuey, Carlisle, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1981, Ser. No. 249,519
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—156 R **8 Claims**



1. An electrical junction connector of the type comprising an insulating housing having oppositely directed first and second mating faces and having a third mating face which is directed laterally of said first and second mating faces, a plurality of parallel feed-through conductors extending between said first and second mating faces and a plurality of tap conductors, each of said tap conductors being connected to one of said feed-through conductors intermediate the ends thereof and extending from said feed-through conductor to said third mating face, said electrical connector being characterized in that:

each of said feed-through conductors comprises an elongated flat stamped member of conductive metal, said feed-through conductors being in parallel side-by-side coplanar relationship, each of said feed-through conductors having a tap conductor receiving opening extending therethrough intermediate its ends, said opening having opposed arcuate edges,

each of said tap conductors comprising a rod-like member having a uniform cross-section along its length, each rod-like member having a first end which is inserted through said opening in its associated feed-through conductor from one surface thereof and beyond the other surface, said tap conductor having an interference fit in said opening whereby said tap conductor is electrically connected to said feed-through conductor,

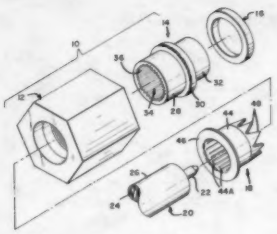
each of said rod-like members having a second end located at said third mating face.

4,408,821

CONNECTOR FOR SEMI-RIGID COAXIAL CABLE

Edgar W. Forney, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 222,188, Jan. 2, 1981, which is a continuation of Ser. No. 55,564, Jul. 9, 1979, abandoned. This application Oct. 5, 1981, Ser. No. 308,760
Int. Cl.³ H01R *11/08*
U.S. Cl. 339—177 R **10 Claims**



1. An electrical connector for terminating semi-rigid coaxial cable, comprising:

a bored tubular shell member having rearward bore means of relatively large inner diameter inwardly contoured toward forward bore means having a relatively smaller inner diameter dimensioned to receive said cable therethrough;

coupling means on said tubular member;

bored gripping means having a rearward collar portion dimensioned to closely receive said cable therethrough, and having a plurality of spline fingers extending forward from the periphery of said collar portion defining therebetween a profiled opening of a dimension substantially equal said cable diameter, and grooves extending along an inside surface of said gripping means, said gripping means being rearwardly disposed of said tubular member, whereby,

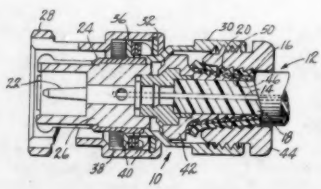
upon moving said gripping means forwardly into said rearward bore means, said spline fingers are resiliently deflected inwardly along said contour to embed into an outer conductive layer of said cable and said grooves engage the outer conductive layer of the cable.

4,408,822

COAXIAL CONNECTORS

Nick C. Nikitas, Danvers, Mass., assignor to Delta Electronic Manufacturing Corp., Beverly, Mass.

Filed Sep. 22, 1980, Ser. No. 189,668
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—177 R **8 Claims**



1. A coaxial connector adapted to be mounted on the end of a coaxial cable having a central conductor, a braided outer conductor, an interposed insulator and a covering sheath of yielding, flexible material, the connector comprising a central conductor and an outer conductive shell respectively connectible electrically to the central conductor and the braided outer conductor of the coaxial cable, the shell having an internally

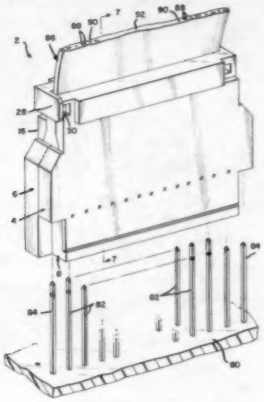
threaded rearward end portion, a bushing having a conical exterior surface adapted to being inserted between the insulator and the braided outer conductor and formed with a plurality of retaining spurs spaced apart in the direction of the axis of the bushing and an externally threaded collar engaging the threads of the shell and formed with a textured interior, tapered in generally parallel relationship with the exterior surface of the bushing for applying a clamping force to the sheath of the cable whereby the textured interior of the collar penetrates and anchors in the covering sheath.

4,408,823

MULTI-PIECE CONNECTOR AND COVER MEANS

John H. Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 10, 1981, Ser. No. 252,770
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—208 **8 Claims**



1. A multi-piece connector assembly comprising:
a connector block having a row of contact receiving cavities within a side surface of said block, said block having a like row of receptacle passageways through a frontal face of said block, each defined by interior side walls and each communicating with a respective one of said cavities;
a cover body for positionment over said side of said block to enclose said contact receiving cavities, and having forwardly projecting means at a forward end for insertion into said row of receptacle passageways and extending to said frontal face, whereby securing said forward end of said cover body to said block.

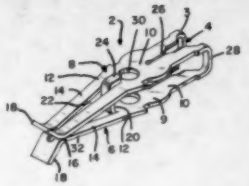
4,408,824

WIRE-IN-SLOT TERMINAL

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 8, 1981, Ser. No. 271,468
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—258 R **9 Claims**

1. A stamped and formed sheet metal electrical contact terminal of the type comprising a wire connecting portion which is intended to receive, and establish electrical contact with a wire, a pair of side-by-side arms extending from said connecting portion, said arms having opposed major surfaces and having converging portions, contact zones on said opposed surfaces at the ends of said converging portions, and end portions which extend from said contact zones to the free ends of said arms, said arms being flexible in opposite directions away from each other and normally of said major surfaces upon movement of a complementary terminal between said arms whereby said contact zones engage said complementary terminal and establish electrical contact therewith, said contact terminal being characterized in that:
a brace extends between said contact arms at a location between said wire connecting portion and said contact zones, said brace being formed from at least one of said arms and functioning to restrain said arms against movement away from each other, the brace comprising a lance



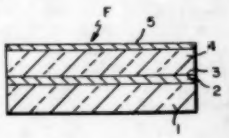
struck from one of the arms and extending along the length of the one arm, the lance extending laterally to the other arm and being secured to the other arm,
the portions of said arms which extend from said brace to said contact zones being cantilever beams, each of said beams having a fixed end at said brace and having an effective length which extends from said brace to said contact zone.

4,408,825

VACUUM ULTRAVIOLET REFLECTANCE FILTER

Lawrence A. Stelmack, Somerville, Mass., assignor to Acton Research Corporation, Acton, Mass.

Filed Nov. 10, 1980, Ser. No. 205,418
Int. Cl.³ G02B *5/28*
U.S. Cl. 350—1.7 **7 Claims**



1. An ultraviolet reflectance filter comprising:
a substrate with a reflective surface;
a spacer layer of transparent dielectric material on said surface; and
a thin film spaced from the reflective surface by the dielectric layer, wherein
said thin film is a heavy metal selected from the group consisting of tungsten, rhenium, osmium, iridium, platinum and gold and heavy metal alloys thereof.

4,408,826

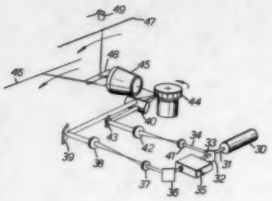
APPARATUS FOR SCANNING A LASER BEAM INCLUDING MEANS FOR FOCUSING A SCALE SCANNING BEAM AND A READ/WRITE SCANNING BEAM ON THE SAME FACET OF A POLYGON SCANNING MIRROR

Toshio Ike, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 30, 1981, Ser. No. 280,053
Claims priority, application Japan, Aug. 5, 1980, 55-107278; Aug. 5, 1980, 55-107279
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **2 Claims**

1. An apparatus for scanning a laser beam, the apparatus comprising:

laser means for generating a single collimated beam;
a beam splitter for permitting a portion of said collimated beam to pass therethrough and for redirecting another portion of said collimated beam as an unmodulated beam;
a modulator for modulating only one of said beam portions to a modulated beam;
a rotating polygon scanner;
means for directing both of said beam portions on the same facet of said polygon scanner, said directing means including a cylindrical lens for focusing said beam portions on a



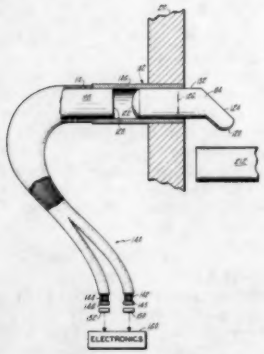
reflecting point of said same facet of said polygon scanner, said beam portions being off the axis of the cylindrical lens;
a scale having precisely spaced means thereon for receiving the unmodulated beam;
a scanning lens for focusing the modulated and the unmodulated beam portions, as reflected by said polygon scanner, to a scanned medium and on the scale, respectively; and
detecting means for receiving the unmodulated beam portion passing through said spaced means and for producing timing pulses for said apparatus.

4,408,827

IMAGING SYSTEM FOR HOSTILE ENVIRONMENT OPTICAL PROBE

Richard W. Guthrie, West Palm Beach, Fla., and Dale M. Byrne, Arlington, Tex., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 2, 1981, Ser. No. 298,829
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.10 **4 Claims**



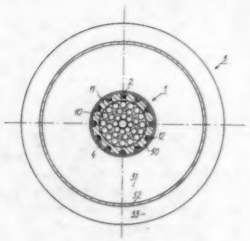
1. An apparatus for collecting optical radiation preferentially from a defined region in a first environment and transporting said radiation to a second environment comprising:
a heat-resistant optical collector transmissive to said radiation and having an internal axis extending from a first end to a collecting end at a predetermined position within said first environment, said collector having a first curved surface having a first radius of curvature on said first end and a reflective surface disposed in said collecting end for reflecting along said axis collected radiation passing through and focused by a second curved surface having a second radius of curvature, said second surface being disposed with respect to said axis and said reflective surface such that said collected radiation reflected along said axis is preferentially collected from a defined region within said first environment and is directed along said axis and through said first curved surface which defined region is located a predetermined distance along an external axis passing through said second curved surface and said reflective surface, said apparatus having a sensitivity for optical radiation that varies as a function of position along said external axis, said sensitivity having a predetermined maximum value for radiation emanating from said defined region;
optical transmission means, having an entrance end and an exit end in said second environment, for transmitting out said exit end radiation passing through said first curved surface and entering said entrance end; and
heat-resistant means for maintaining said entrance end in proximity to said first end and for maintaining said collecting end in said predetermined position within said first environment.

4,408,828

OPTICAL FIBRE SUBMARINE CABLE

Georges E. Le Noane, Kerrougant Bras, Tregastel, France 22730, and Bernard G. Nonclercq, Kergomar Troguery, La Roche Derrien, France 22450

Filed Nov. 20, 1980, Ser. No. 208,684
Claims priority, application France, Nov. 22, 1979, 79 28850
Int. Cl.³ G02B *5/16, 5/172*
U.S. Cl. 350—96.23 **27 Claims**



1. An optical fibre cable comprising:
a central member including a central strand of metal wires and a tubular grooved jacket,
said grooved jacket including juxtapositioned cylindrical cross-section segments surrounding said metal wire strand, each of said cylindrical segments having an outer periphery including one or more helicoidal grooves, each receiving at least one optical fibre; and
a tubular sheath having a jacket surrounding said central member and closing said grooves of said grooved jacket,
said grooved jacket and said jacket surrounding said central member being metallic.

4,408,829

FIBER OPTIC TRANSDUCERS

Robert W. Fitzgerald, Jr.; Robert L. Hall, and Gary P. Bickford, all of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

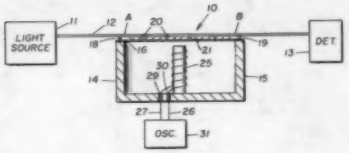
Filed Jan. 30, 1981, Ser. No. 229,823
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.29 **6 Claims**

1. An optical transducer comprising a housing having an

open end, a flexible diaphragm stretched across said open end and secured to said housing so as to be subject to displacement upon application of a force thereto,

a length of multimode optical fiber,

means for mounting said fiber relative to said diaphragm such that displacement of said diaphragm effects microbending at at least one point along said fiber to vary the transmission mode characteristics of said fiber as a function of the force, wherein said mounting means includes a rigid member secured to one surface of said diaphragm being concentric therewith and having an area less than the area of said diaphragm.

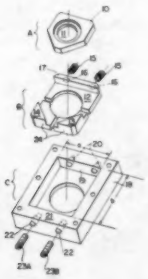


4,408,830

MULTIDIRECTIONAL TRANSLATOR MECHANISM

Hermann A. Wutherich, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1981, Ser. No. 239,717
Int. Cl.³ G02B *7/02*
U.S. Cl. 350—247 **5 Claims**



1. A planar translation device for alignment of one part relative to another comprising, in combination:

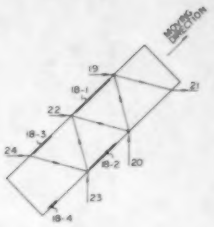
a mounting plate holder, an optical element mounted in said holder that requires alignment in one single plane to a fixed beam, an adjustable cradle means for cradling the mounting plate holder comprising a multi-section segment that is split into three sections, with a housing for moving the mounting plate by means of the adjustable cradle parts along both the x axis and y axis with projecting adjustment means that project through the wall of the housing.

4,408,831

OPTICAL SWITCH

Haruo Sakaguchi; Norio Seki, both of Tokyo; Shu Yamamoto, Chofu, and Hiroharu Wakabayashi, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,311
Claims priority, application Japan, Sep. 5, 1980, 55-122270
Int. Cl.³ G05D *25/00*
U.S. Cl. 350—269 **7 Claims**



1. An optical switch comprising:

a transparent plate having a pair of parallel planes,

a reflection film provided on both of said parallel planes,

a first input means for providing a first input beam to a first plane of said transparent plate, wherein the angle between the first beam and the first plate is 45°,

a second input means for providing a second input means to the first plane of said transparent plate through a second plane of said transparent plate, wherein the angle between the second beam and the second plane is 45°,

output means for providing an output beam by receiving one of the input beams through said transparent plate,

said input beams and output beam residing in the plane perpendicular to the transparent plate,

said second input means being provided so that the angle between the first and the second input beams is 90°, and the second input beam illuminates the same spot of the first plane as the first input beam does,

said output means being provided so that the first input beam is coupled with the output means through the transparent plate, and the second input beam is coupled with the output means through the reflection by the reflection film,

means for displacing said transparent plate together with the reflection film in the plane defined by said transparent plate, and

a housing for securing the above components.

4,408,832

MIRROR ADJUSTING FIXTURE

Paul R. Hartman, and Thomas B. Milam, both of Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

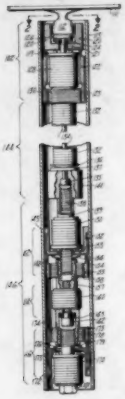
Filed Dec. 7, 1981, Ser. No. 328,298
Int. Cl.³ G02B *7/18, 5/08;* H01L *41/08*
U.S. Cl. 350—310 **1 Claim**

1. An adjusting device for applying force along an axis to a projecting member affixed to the rear surface of a deformable mirror comprising:

a support tube directed substantially along said axes and having a cylindrical interior surface, gripping means having three prongs for gripping said projecting member, said prongs being released in response to movement of a first piezoelectric actuator, dynamic piezoelectric actuator means for applying temporally variable force to said deformable mirror in response to control signals, said force being transmitted to said mirror along said axis and through said gripping means;

stepping and positioning means connected to said dynamic actuator means for moving said dynamic actuator means

and said gripping means through said tube along said axis from a first position to a second position, said stepping and positioning means further including first and second locking means spaced apart axially and having first and second sets of three locking prongs, radially movable in response to first and second piezoelectric actuators, respectively, for clamping said stepping means in said support tube



thereby providing a support with respect to which force is applied to said deformable mirror, and further including a piezoelectric extending means for altering the axial spacing of said first and second locking means, whereby the axial position of said gripping means may be varied by sequential energization of said first locking means, extending means and second locking means.

4,408,833

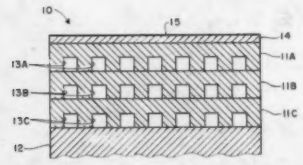
HOT PRESSED AND DIFFUSION BONDED LASER MIRROR HEAT EXCHANGER

John G. Gowan, London, England, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 13, 1982, Ser. No. 339,260

Int. Cl.[3] **G02B** *5/08;* **B22F** *5/00;* **C22C** *27/04;* **B32B** *15/02*

U.S. Cl. 350—310 **8 Claims**



1. A fluid cooled laser mirror structure which comprises:

a. a heat exchanger defining a plurality of internal passageways for conducting fluid coolant therethrough, said heat exchanger comprising a hot pressed member of powdered tungsten carbide and a binder, said hot pressed member having on a first surface thereof a plurality of channels configured in a predetermined pattern, and a backing plate covering said first surface to define said passageways configured in said pattern;

b. inlet and outlet means communicating with said passageways for conducting said fluid coolant into and out of said heat exchanger; and

c. a mirrored surface supported by said member adjacent a second surface of said pressed member.

4,408,834

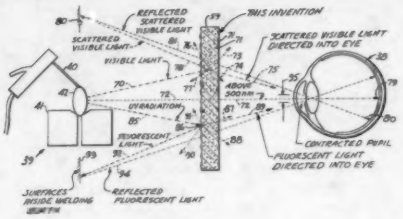
CURTAIN FOR SHROUDING WELDING OPERATIONS

Charles G. Miller, 841 S. Oak Knoll Ave., Pasadena, Calif. 91106, and James B. Stephens, 2303 Maurice Ave., La Crescenta, Calif. 91214

Division of Ser. No. 201,052, Oct. 27, 1980, Pat. No. 4,330,177, which is a continuation of Ser. No. 946,163, Sep. 27, 1978, abandoned. This application Jan. 20, 1982, Ser. No. 341,004

Int. Cl.[3] **G02B** *27/00;* **A47G** *5/00*

U.S. Cl. 350—321 **6 Claims**



1. In a welding curtain of substantial area forming at least a portion of the perimeter of an area in which an electrical arc welding or an electrical arc cutting operation is conducted, for the purpose of protecting an observer from damage to his eyes by light from welding or cutting arcs, said curtain having a pair of surfaces spaced apart by a dimension of thickness, and, being sufficiently clear for said observer to see through it an object of substantial size located inside said perimeter, the improvement comprising:

discontinuities distributed throughout the curtain, said discontinuities having an optical index of refraction which differs from the optical index of refraction of the material of which the curtain is primarily made by at least 0.2 units, so as to scatter from 5% to less than 50% of the light which passes through the curtain and thereby to cause a decrease in scene contrast.

4,408,835

VIEWING SYSTEM WITH AUTOMATIC CORRECTION OF THE READING DISTANCE AS A FUNCTION OF THE INCLINATION OF THE VIEWING SCREEN HOUSING

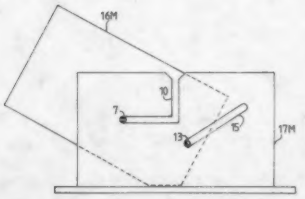
Michel Deprez, Epernon; Andre Fromion, L'Haye les Roses; Claude Hardouin, Villiers St Frederic, and Jean C. Vilas Boas, Sannois, all of France, assignors to 501 Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 23, 1981, Ser. No. 333,745

Claims priority, application France, Dec. 30, 1980, 80 27771

Int. Cl.[3] **G03B** *21/56, 21/14, 21/22*

U.S. Cl. 350—117 **3 Claims**



1. In a viewing system having a viewing screen situated within a housing (16M) suspended along a horizontal axis (9) on a U shape base (17M) including vertical wings, the said horizontal axis (9) passing substantially in the region of the

center of gravity of the screen housing (16M), the improvement comprising:

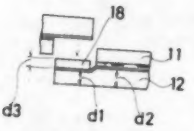
means for suspension of the screen housing on the base, said suspension means comprising cylindrical pins (7) and (8) disposed on opposite sides of the screen housing and extending therefrom for insertion in L shape slots (10) in the wings of the base (17M), each of said L shape slots have a vertical branch open at the upper part of the associated wing so as to permit insertion of the said cylindrical pins (7) and (8), and a horizontal branch permitting horizontal translation movement of the screen housing (16M), and means for coordination of the movements of the screen housing, said means for coordination comprising guide pins (21) and (22) disposed on opposite sides of the screen housing (16M) and adapted to be inserted in slots (15) (36) (37) in the wings of the base (17M), being inclined to the horizontal to accomodate tilting movement of the screen housing (16M) and horizontal translation movement of the said screen housing (16M) upon displacement of the said cylindrical pins (7) and (8) along the horizontal branch of the said L shape slot.

4,408,836

WIDE SCREEN LCD PANEL WITH ELECTRICAL TERMINAL CONNECTIONS

Masayuki Kikuno, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1981, Ser. No. 238,817
Claims priority, application Japan, Feb. 28, 1980, 55-24885
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—334 **5 Claims**



1. A liquid crystal display device comprising:

a plurality of liquid crystal display cells in a substantially coplanar arrangement;

each cell comprising two plates disposed in parallel planes;

each of said plates having a length which exceeds the width of the other of said plates, the lengths of the respective plates extending in respective directions which are normal to each other, thereby forming extension portions for overlapping similar extension portions of adjacent cells;

lead terminals disposed on said extension portions of said plates; and

electrically conductive members for connecting said lead terminals of respective ones of said cells to said lead terminals of adjacent coplanar cells in overlapping and electrically conductive relationship.

4,408,837

ANTIREFLECTION, LIQUID CRYSTAL, ELECTRODE AND NONCONDUCTIVE LAYER

Syuichi Kozaki, Nara; Fumiaki Funada, Yamatokoriyama, and Shigehiro Minezaki, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

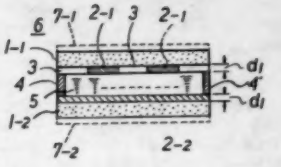
Filed Jun. 26, 1981, Ser. No. 277,847
Claims priority, application Japan, Jun. 26, 1980, 55-87619
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—336 **4 Claims**

1. A liquid crystal cell comprising:

a pair of opposing supports one carrying a patterned electrode and the other carrying a counter electrode placed vis-a-vis with the patterned electrode; and

a liquid crystal material sandwiched between the two electrodes,

wherein at least the patterned electrode comprises an In_2O_3



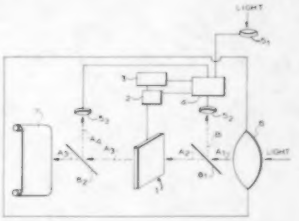
coating and a remaining portion of the support where the In_2O_3 coating is not disposed comprises a CeO_2 coating whose refractive index is substantially equal to that of the In_2O_3 coating.

4,408,838

SYSTEM FOR THE REGULATION OF LIGHT FOR A SEQUENTIAL PICTURE APPARATUS

Neal Factor, 33-52 Crescent St. #4A, Long Island City, N.Y. 11106

Filed Mar. 14, 1979, Ser. No. 20,915
Int. Cl.³ G02F *1/13*; G03B *19/18, 27/72, 27/73*
U.S. Cl. 350—347 E **4 Claims**



1. A system for the regulation of light entering a motion picture camera having at least a lens for producing an image therein and a film for recording said image having a film stock color temperature characteristic, said system comprising:

means for regulating the color temperature of said light including at least one liquid crystal plate assembly, disposed in the path of said light entering said motion picture camera, having two spaced, crossed polarization filters, a nematic liquid crystal plate, located between said filters capable of regulating the selective color transmissivity thereof by the interference of the ordinary and the extraordinary light rays entering said plate assembly due to the alignment of the crystals in said liquid crystal plate when a potential for the duration of time interval is applied thereacross, and a pair of electrodes situated on both sides of said liquid crystal plate for supplying said potential thereacross;

means for monitoring the color temperature of said light including at least a color temperature meter having an electrical output related to the color temperature of said light;

a logic circuit, connected to the output of said color temperature monitoring means, having at least,

means for pre-setting a color temperature reference value therein equal to said film stock color temperature characteristic;

means, responsive to said color temperature reference value pre-setting means, and to said color temperature monitoring means, for calculating said potential and for

calculating said duration of the said time interval for the application of said potential to said liquid crystal plate necessary for the color temperature of said light passing through said liquid crystal plate assembly to equal said color temperature reference value;

a variable voltage source connected to said logic circuit and responsive to said calculation means thereof, having means for supplying said potential as calculated by said calculation means of said logic circuit; and

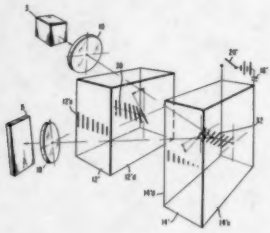
a timer, connected to said variable voltage sourse, to said electrodes and to said logic circuit and responsive to said calculation means thereof, having means for regulating said duration of said time interval, as calculated by said calculation means of said logic circuit, that said potential is supplied to said electrodes.

4,408,839

TWISTED NEMATIC LIQUID LIGHT VALVE WITH BIREFRINGENCE COMPENSATION

Eliezer Wiener-Avnear, Carlsbad, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 1, 1981, Ser. No. 249,754
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—347 R **17 Claims**



1. A light valve for controlling light propagating along an axis of propagation, said light valve comprising:

a pair of optically birefringent layers, each of said layers having a front surface and a back surface facing the back surface of the other layer, said front and back surfaces being nonparallel to said propagation axis;

each of said layers having a major optical axis corresponding to parallel refractive indices exhibited to radiation components polarized in a direction parallel to said optical axis and perpendicular refractive indices exhibited to radiation components polarized in a direction perpendicular to said optical axis;

wherein said optical axis of one of said two layers at its back surface is substantially perpendicular to the optical axis of the other of said two layers at the back surface of said other layer and said optical axis of one of said two layers at its front surface is substantially perpendicular to the optical axis of the other of said two layers at the front surface of said other layer and each is twisted along said axis of propagation in opposite directions with respect to the other; and

means for polarizing light incident on said front surface of one of said layers so that said incident light may resolve into said parallel and perpendicular radiation components in said one layer and so that a total phase shift of substantially zero is introduced between said parallel and perpendicular radiation components as they travel along said propagation axis through both said two layers.

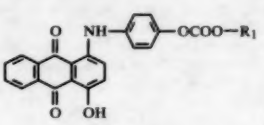
4,408,840

LIQUID CRYSTAL COMPOSITIONS CONTAINING PLEOCHROIC ANTHRAQUINONE DYES, LIQUID CRYSTAL DEVICES CONTAINING THE COMPOSITIONS, AND THE DYES

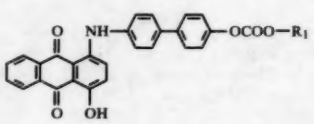
Shuji Imazeki, Hitachi; Akio Mukoh, Mito, and Mikio Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,360
Claims priority, application Japan, Sep. 22, 1980, 55-130689
Int. Cl.³ G02F *1/13*; C09K *3/34*; C09B *1/514*
U.S. Cl. 350—349 **5 Claims**

1. A liquid crystal composition containing a pleochroic anthraquinone dye, said dye having one of the two following formulae I and II:



(I)



(II)

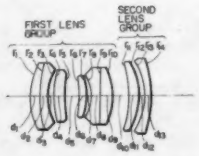
wherein R_1 is selected from the group consisting of alkyl and cycloalkyl.

4,408,841

VARIABLE POWER LENS SYSTEM FOR COPYING

Yasunori Arai, Hatoyama, and Ryota Ogawa, Kawagoe, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,728
Claims priority, application Japan, Oct. 18, 1980, 55-145989
Int. Cl.³ G02B *15/00*
U.S. Cl. 350—425 **2 Claims**



1. In a variable power lens system for copying, composed in order from the object side, of a first lens group having a positive focal length and a second lens group having a negative focal length, in which a distance between said first and second lens groups is variable and the overall lens system is movable while maintaining constant a distance between the object surface and the image surface, said variable power lens system for copying comprising an improvement wherein the movement of the first lens group functions mainly as a variator of magnification power and the second lens group mainly serves to maintain constant the distance between the object surface and the image surface, said first lens group being constructed on the basis of a single focal lens system used for copying, and being composed, in order from the object side, of a cemented lens consisting of a positive lens a convex surface of which is directed to the object and a negative lens a concave surface of which is directed to the image, a positive meniscus lens a convex surface of which is directed the object, a positive meniscus lens a convex surface of which is directed to the

image, and a cemented lens consisting of a negative lens a concave surface of which is directed to the object side and a positive lens a convex surface of which is directed to the image, and said second lens group consisting of a positive meniscus lens a convex surface of which is directed to the image side, said variable power lens system satisfying the following conditions:

$$Mmax/Mmin < 3.0 \quad (1)$$

$$1.2 < |f_{II}|/f_{max} < 3.0 \ (f_{II} < 0) \quad (2)$$

$$0.02 \leqq \Delta D_{I,II}/f_{max} \leqq 0.20 \quad (3)$$

$$0.10 \leqq |r_{IIP}|/f_{max} \leqq 0.30 \ (r_{IIP} < 0) \quad (4)$$

where,

Mmax is the magnification on the high magnification side (on the enlargement side) in the magnification power range;

Mmin is the magnification on the low magnification side (on the reduction side) in the magnification power range;

Mmax/Mmin is the ratio of variable power;

f_{max} is the overall focal length of the lens system at an equal magnification;

f_{II} is the focal length of said second lens group;

$\Delta D_{I,II}$ is the amount of movement between said first and second lens groups; and

r_{IIP} is the radius of curvature of the image side surface of the positive meniscus lens in the second lens group.

4,408,842

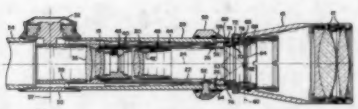
TELESCOPIC SIGHT HAVING LENS HOLDER TUBE WITH HALF SOCKET PIVOT MOUNT

Dale E. Gibson, Salem, Oreg., assignor to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed Oct. 8, 1981, Ser. No. 309,826

Int. Cl.³ G02B 27/32

U.S. Cl. 350—560 **20 Claims**



1. A telescopic sight apparatus, comprising:

a lens holder tube containing lenses including at least one erector lens therein mounted in alignment along an optical axis;

support means for supporting said tube within a housing between an objective lens system forward of the front end of said tube and an eyepiece lens system rearward of the rear end of said tube;

pivot means for pivotally mounting the rear end portion of said tube;

adjustment means engaging the front end portion of said tube for adjusting the position of said tube by pivoting it about said pivot means in at least two mutually perpendicular directions; and

reticle means supported within said housing between said objective lens system and said eyepiece lens system;

said pivot means being a half socket pivot means including a socket surface in engagement with a spherical pivot surface on said rear end portion of said tube and a socket spring for resiliently urging said pivot surface in contact with said socket surface.

4,408,843

HINGE JOINT FOR CHILDRENS EYEGLASSES

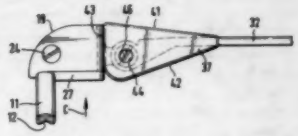
Walter H. Bononi, Zeppelinstrasse 9, 7012 Fellbach-Schmiden, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,266

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945938

Int. Cl.³ G02C 5/14, 5/22

U.S. Cl. 351—153 **8 Claims**



1. A metal hinge joint for children's glasses, comprising:

a lens bow having a temporal region,

a temple,

a first hinge half firmly connected to said temporal region of the said lens bow,

a second hinge half firmly connected to said temple, and

a homogeneous silicone body covering at least one of said hinge halves, said silicone body having a Shore-D hardness of between 10 to 30 measured according to DIN 53505, said silicone body having the form of a bushing, said silicone bushing surrounding one of said hinge halves and extending at least in part over both hinge halves.

4,408,844

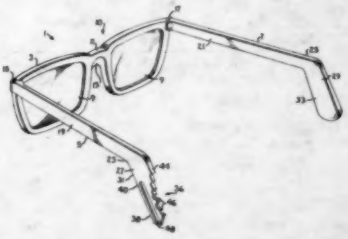
EYEGLASS FRAME WITH STRUCTURAL SPARE KEY

Arnold Schoolman, 400 Rockhill Medical Bldg., 6700 Troost Ave., Kansas City, Mo. 66131

Filed Jul. 30, 1981, Ser. No. 288,470

Int. Cl.³ G02B 1/24

U.S. Cl. 351—158 **10 Claims**



1. An eyeglass frame structure comprising:

(a) a lens support member including a portion thereof engageable with and partially supported by a nose of a user of said eyeglass frame structure;

(b) a pair of lenses retained within said lens support member, each lens placed in optical alignment with an eye of said user;

(c) at least one temple bar extending from and connected to a side of said lens support member, said temple bar including on a distal end thereof an earpiece engageable with an ear of a user thereof, said eyeglass frame structure being partially supported by said earpiece, and wherein:

(d) said earpiece, being in the form of a key member; said key member includes thereon suitable ridges and grooves mateable with tumbler pins of an associated lock so as to

allow said key member to be utilized to unlock such a lock.

4,408,845

IONICALLY COAGULATED HYDROPHILIC POLYELECTROLYTE CONTACT LENS

Maurice Seiderman, 3306 Deronda Dr., Hollywood, Calif. 90068

Division of Ser. No. 78,196, Sep. 24, 1979, Pat. No. 4,273,734.
This application Nov. 17, 1980, Ser. No. 208,490
Int. Cl.³ G02C *7/04*
U.S. Cl. 351—160 H **3 Claims**

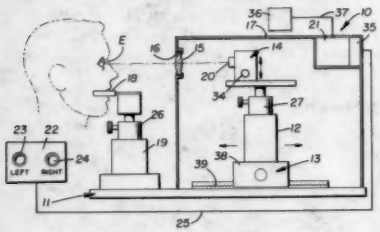
1. A contact lens, comprising a transparent, self-sustaining and three-dimensional, irreversibly gelled, ionically coagulated hydrophilic polyelectrolyte material hydrated with water, said polyelectrolyte material being selected from the group consisting of naturally occuring polysaccharides and collagen.

4,408,846

METHOD AND APPARATUS FOR INCREASING VISUAL ACUITY

Richard F. Balliet, Martinez, Calif., assignor to Andrew M. Clay, San Francisco, Calif., a part interest

Filed Feb. 2, 1981, Ser. No. 230,905
Int. Cl.³ A61B *3/00, 3/02*
U.S. Cl. 351—203 **30 Claims**



1. The method of increasing visual acuity of a myopic person, comprising the steps of:

determining the far point of the myopic person's visual acuity;

providing a target having randomly different appearances each of which can be identified by a person when positioned at an effective optical distance from the person equal to said person's far point;

positioning the target at a first position closer to the person than said far point with the target randomly displaying one of said appearances for identification by said person

moving the target away from the person to a second position further from the person than said first position in the event the identification of the target appearance at said first position was correct, or alternatively moving the target toward the person to a third position closer to the person than said first position in the event the identification of the target appearance at said first position was incorrect; and

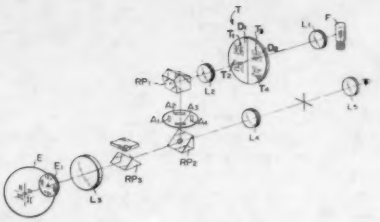
repeating such alternative movement of the target alternatively toward or from the person to new positions in accordance with the correctness or incorrectness of the identifications at each new position.

4,408,847

REFRACTORY POWER MEASURING DEVICE

Shinji Wada; Yoshinori Oana; Ikuo Kitao; Yasuo Kato, and Taketoshi Ishihara, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed Nov. 5, 1980, Ser. No. 204,229
Claims priority, application Japan, Nov. 9, 1979, 54-145270
Int. Cl.³ A61B *3/10*
U.S. Cl. 351—211 **5 Claims**



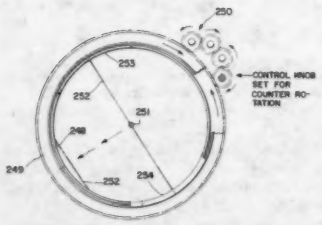
1. A refractory power measuring device comprising a target projecting optical system for optically projecting a target through an optical body to be inspected to produce an image of the target, said target projecting optical system including means for moving the target along an optical axis of the system, means for observing the image of the target to locate a position of the target along the optical axis wherein the image of the target is focussed at a predetermined position, said target including two optical elements adapted for measuring refractory powers in orientations perpendicular with each other, one of said optical elements being at one side of the optical axis and the other being at the other side of the optical axis, said two optical elements being located close to each other and movable generally parallel to the optical axis independently from and without any interference with each other.

4,408,848

APPARATUS FOR INDICATING A LINE AND FOR PRODUCING AND VISUALLY DISPLAYING AN IMAGE OF A LINE INDICATOR

Fred C. Gast, 209 W. El Bonito Dr., Ocean Springs, Miss. 39564

Filed Oct. 21, 1977, Ser. No. 844,439
Int. Cl.³ G03B *21/00, 21/10*
U.S. Cl. 353—11 **28 Claims**



1. Apparatus for indicating a line comprising

a support means,

plural means for indicating a line, and

plural means carried by the said support means for mounting the said line indicating means and altering the relative position thereof,

each of the said plurality of line indicating means including a movable and rotatable suspended elongated line indicator having a linear axis and first and second end portions, each of the said plurality of mounting and position altering

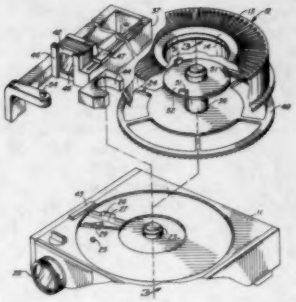
means including first rotatable suspension means rotatably carried by the said support means for supporting the said first end portion of a given line indicator and second rotatable suspension means rotatably carried by the said support means for supporting the said second end portion of the said given line indicator, each of the said line indicators being suspended between their respective said first and second suspension means and each of the said first and second suspension means being rotatable around a common axis, the said mounting and position altering means including means carried by the said support means for rotating each of the said first and second suspension means around the said common axis, the said rotating means including means for co-rotating each of the said first and second suspension means and means for counter-rotating each of the said first and second suspension means, the respective said first and second suspension means for each of the said suspended line indicators including means cooperating therewith for varying the effective suspended length of each of the line indicators as the said first and second suspension means are counter-rotated by the said counter-rotating means, each of the said line indicators being suspended by its respective said first and second suspension means whereby it is movable in a direction substantially perpendicular to the said linear axis and whereby it is also rotatable around the said common axis, the said first and second rotatable suspension means for a given suspended line indicator including means for moving the said given suspended line indicator in a direction substantially perpendicular to the said linear axis when the said first and second suspension means therefor are counter-rotated by the said counter-rotating means, the said common axis being angularly disposed with respect to the said linear axis and also being angularly disposed with respect to the direction of movement of the said given suspended line indicator by the said means for moving the said given suspended line indicator, the said first and second suspension means for the said given suspended line indicator including means for rotating the said given suspended line indicator around the said common axis when the said first and second suspension means therefor are co-rotated, each of the said suspended line indicators being suspended by its respective said first and second suspension means whereby when it is moved to a desired position by the said moving means the said common axis is substantially perpendicular to the said linear axis and is also substantially perpendicular to the direction of movement of the line indicator by the said moving means, each of the said suspended line indicators being movable in a fixed plane by the said moving means and being rotatable in substantially the same fixed plane by the said line indicator rotating means, each of the said suspended line indicators being movable by the said moving means to a position whereby the said common axis passes through the said linear axis and when a given line indicator is in this position the said common axis passes through the said linear axis at a point substantially equidistant the ends of the suspended length of the said given line indicator, and a plurality of the said line indicating means being carried by the said mounting and position altering means in a superimposed nestled relationship, the resultant plurality of the said line indicators thereof being suspended by their respective said first and second suspension means in a closely adjacent superimposed nestled relationship, and the said line indicators being moved by their respective said moving means and being rotated by their respective said line indicator rotating means in their respective closely adjacent superimposed fixed planes to positions wherein they are angularly disposed with respect to each other.

4,408,849

SLIDE MACHINE LOADING APPARATUS

Ralph A. Sickles, 1418 Steamboat Bend, Tempe, Ariz. 85283

Filed Nov. 22, 1982, Ser. No. 443,431
Int. Cl.³ G03B *23/00*
U.S. Cl. 353—103 **5 Claims**



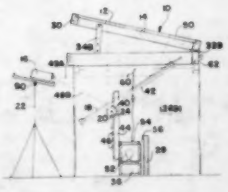
1. Loading apparatus for a slide magazine having individual compartments for containing photographic slides, said magazine being adapted for use with a projector adapted to receive slides from the magazine, said projector being equipped with means for returning slides to a compartment of said magazine and means for advancing the magazine to expose the next compartment of the magazine, said loading apparatus comprising a tray adapted to contain a stack of slides to be loaded into the compartments of said magazine, means for positioning said tray between said projector and said magazine, means associated with said tray and responding to motion of the slide returning means of said projector for moving the endmost slide from said stack of slides in said tray into a compartment of said magazine and means connecting the magazine advancing means of said projector to the magazine to advance said magazine and expose the next compartment for loading with a slide.

4,408,850

DRAWING TABLE

George G. Norek, 8534 Roseview Dr., Niles, Ill. 60648

Filed Aug. 10, 1981, Ser. No. 291,274
Int. Cl.³ G03B *21/10*
U.S. Cl. 353—122 **7 Claims**



1. A drawing table comprising:

an at least substantially translucent panel having a working surface;

means supporting said panel comprising a frame supported on a pair of spaced apart substantially parallel side walls, wherein said frame is pivotally mounted at its forward edge to the top surfaces of said side walls;

means for translating said panel to a plurality of positions whereby said working surface can be disposed in a plurality of oblique angles from said top surfaces of said side walls;

means for illuminating said working surface through said panel seated between said side walls; and

means for optically projecting an image onto said working surface through said panel at a plurality of angles of impingement and at variable scales comprising a detachable mirror pivotally mounted about its upper edge to mirror support means mounted on the inner faces of said side walls, means for translating said mirror support means to a plurality of positions along the horizontal along said inner faces, a detachable roller that is supported on an axial shaft and disposed between said side walls and adjustable to a plurality of positions along the vertical, wherein said mirror is held at an oblique angle at least partially spaced between said panel and said illuminating means when said mirror support means is in at least one of its positions while said roller is in at least one of its positions, and a projector adapted to project an image to at least one of said panel and mirror, said projector being mounted so as to be translatable to a plurality of positions from said mirror.

4,408,851

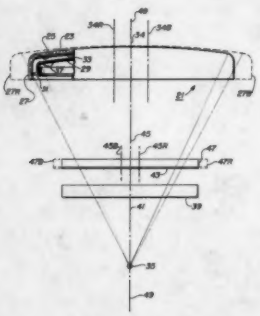
PHOTOGRAPHIC METHOD FOR PRINTING A VIEWING-SCREEN STRUCTURE USING A LIGHT-TRANSMISSION FILTER

Thomas L. Chase, and George M. Ehemann, Jr., both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 19, 1982, Ser. No. 379,870

Int. Cl.³ G03B *41/00*

U.S. Cl. 354—1 **7 Claims**



1. In a method for printing a viewing-screen structure for a cathode-ray tube including projecting a light field from a light source through a path-refracting lens, a light-transmission filter and incident upon a photosensitive layer, said lens, filter and layer having nominal axes that are substantially parallel to one another, and repeating said projecting step at least a total of three times, the combination of requirements that

A. during one of said projecting steps, said light source and said axes are aligned along a common axis,

B. during another of said projecting steps, said light source and the axis of said lens are aligned along said common axis, the axis of said layer is offset a prescribed first distance to one side of said common axis, and the axis of said filter is offset a prescribed second distance to the opposite side of said common axis and

C. during the other of said steps, said light source and the axis of said lens are aligned along said common axis, the axis of said layer is offset a prescribed third distance to said opposite side of said common axis, and the axis of said filter is offset a prescribed fourth distance to said one side of said common axis.

4,408,852

AUTOMATIC EXPOSURE CONTROLLER FOR CAMERA OF TTL DIRECT PHOTOMETRY TYPE

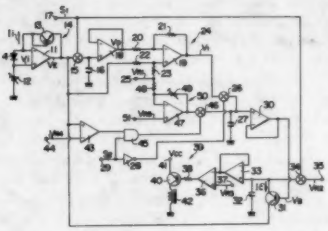
Masafumi Yamasaki, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Nov. 19, 1981, Ser. No. 322,853

Claims priority, application Japan, Dec. 5, 1980, 55-172452; Feb. 23, 1981, 56-025759

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—24 **6 Claims**



1. Automatic exposure controller for a camera of TTL direct photometry type including a photoelectric transducer element which effects photometry of light from an object being photographed which light passes through a taking lens of the camera, is reflected by a first blind surface and a film surface which becomes exposed as the first blind runs and impinges on the transducer element, a proper exposure period being determined in accordance with a photometric output from the photoelectric transducer element, the controller comprising:

(A) a logarithmic compression circuit for producing a voltage which represents a logarithmic compression of a photocurrent produced by the photoelectric transducer element;

(B) a storage circuit for storing an output voltage from the logarithmic compression circuit which corresponds to light reflected from only the first blind surface at the initiation of running of the first blind;

(C) a subtraction circuit for detecting a difference between the voltage stored in the storage circuit and the output voltage from the logarithmic compression circuit;

(D) a logarithmic expansion circuit for producing an output current which:

(1) varies in response to both an output voltage from the subtraction circuit and an output voltage from the logarithmic compression circuit during a first exposure period which starts at the initiation of a shutter release operation and ends when the shutter is fully open, said output voltage from said subtraction circuit being permitted to vary as a function of said output voltage from said logarithmic compression circuit during said first exposure period; and thereafter

(2) varies in response to both a voltage which is derived from the subtraction circuit and which remains fixed once the shutter is fully open and to the output voltage from the logarithmic compression circuit during a second exposure period which follows said first exposure period;

(E) an integrating circuit for integrating an output current from the logarithmic expansion circuit to determine an exposure period; and

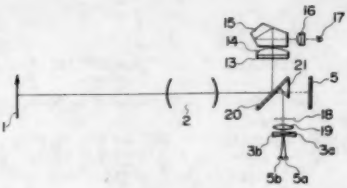
(F) a shutter control circuit for terminating an exposure operation in response to an output of the integrating circuit which reaches a given value.

4,408,853

FOCUS DETECTING DEVICE

Seijiro Tokutomi; Kazuo Nakamura, both of Tokyo, and Kasao Jyojiki, Tsurugashima, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1978, Ser. No. 955,440
Claims priority, application Japan, Oct. 27, 1977, 52/128951
Int. Cl.³ G03B 3/10
U.S. Cl. 354—25 12 Claims



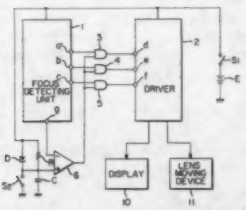
1. A focus detecting device comprising:
a lens system having an optical lens for forming an object image at a lens focal plane;
split prism means, including first and second prisms disposed between said optical lens and said focal plane with each of said prisms receiving light passing through a different half of said optical lens, for dividing said object image into two identical images;
at least first and second light receiving elements disposed on an image forming surface and positioned such that both are illuminated substantially equally when said lens system is focused, said first element receiving greater illumination when said optical system is out-of-focus in a first direction and said second element receiving greater illumination when said optical system is out-of-focus in a second opposite direction; and
signal processing means receiving the output of said light receiving elements and generating an output signal indicative of focus adjustment.

4,408,854

AUTOMATIC FOCUS DETECTING APPARATUS OF A CAMERA

Nobuhiko Terui, Tokyo, and Sakuji Watanabe, Warabi, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,660
Claims priority, application Japan, Feb. 3, 1981, 56-13220[U]
Int. Cl.³ G03B 3/00
U.S. Cl. 354—25 5 Claims



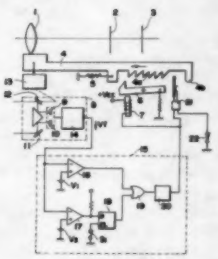
1. An automatic focus detecting apparatus of a camera comprising:
a focus detecting unit for receiving the light from an object to be photographed and producing a focus detection output;
a driving circuit responsive to said focus detection output to effect the driving of at least one of a phototaking lens and a focus condition display;
an object brightness detecting unit for producing a brightness detection output corresponding to the brightness of the object;
means for producing a time count starting signal;
a timer circuit adapted to start time count in response to said time count starting signal and produce a blocking signal in response to said brightness detection output for a short time if the brightness is high or for a long time if the brightness is low; and
a blocking circuit for preventing said driving circuit from responding to said focus detection output during the time said blocking signal is produced.

4,408,855

AUTOMATIC FOCUS ADJUSTING DEVICE FOR USE IN A CAMERA

Toshinori Imura, and Shinji Tominaga, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashi, Japan

Filed May 28, 1982, Ser. No. 382,937
Claims priority, application Japan, Jun. 1, 1981, 56-84835
Int. Cl.³ G03B 3/10
U.S. Cl. 354—25 9 Claims



1. An automatic focus adjusting device for use in a camera which permits flash photography by means of an electronic flash device comprising:
an objective lens including a movable lens element movable along the optical axis of the objective lens to change the focusing thereof;
means for shifting said movable lens element along the optical axis from its infinity focusing position toward its closest focusing position;
means for detecting a proper position of said movable lens element on a target object by scanning from an infinity position towards the closest position and for generating an in-focus signal when said movable lens element is positioned on said proper position;
means for comparing a contrast of an image of said target object with a predetermined contrast level prior to the lens shifting and for generating a substitute signal when said movable lens element is positioned on its infinity focusing position if the contrast of said image is lower than said predetermined contrast level;
means for stopping the lens shifting when said in-focus signal or said substitute signal is received thereby, and
means for restraining the effect of said in-focus signal or said substitute signal on said stopping means until said movable lens element is shifted to a position corresponding to a maximum permissible distance for flash photography, when said camera is set in a flash photography mode.

4,408,856

DEVICE FOR LOCKING A BLADE DRIVER IN AN ELECTRONIC SHUTTER

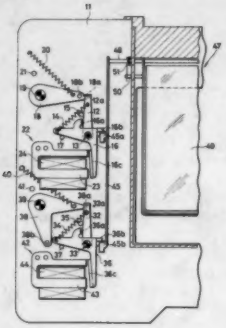
Akira Suzuki; Yukio Yoshikawa, both of Tokyo, and Katumi Kaneko, Ageo, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,633

Claims priority, application Japan, Dec. 9, 1980, 55-177401[U]; Feb. 2, 1981, 56-13399[U]; Feb. 25, 1981, 56-26233[U]

Int. Cl.³ G03B *9/08*

U.S. Cl. 354—234 **5 Claims**



1. A blade driver locking device for use with an electronic shutter in a camera, comprising:

a base;

a driver mounted on said base for actuating a shutter blade;

a locking member mounted on said base for locking said driver against movement to actuate the shutter blade;

an electromagnet mounted on said base and energizable for attracting said locking member out of locking engagement with said driver; and

means mounted on said base and actuatable in one direction prior to starting of an exposure operation and in an opposite direction upon completion of the exposure operation for retaining said locking member against movement to unlock said driver while said means is at rest before and after being actuated.

4,408,857

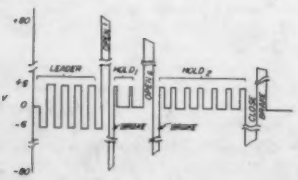
METHOD AND CIRCUIT FOR CONTROLLING AN ELECTROMAGNETIC ACTUATOR IN PHOTOGRAPHIC APPARATUS

Lee F. Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,281

Int. Cl.³ G03B *7/097, 9/02, 9/62*

U.S. Cl. 354—234 **23 Claims**



1. In photographic apparatus having an electromagnetic actuator of the type including an armature mounted for movement between a rest position and an extreme position in a magnetic field and means for urging the armature toward the rest position, a control circuit comprising:

means for applying a first polarity voltage pulse to said armature of duration effective for moving said armature against the force of said urging means to a programmed position between said rest position and said extreme position; and

means for applying an opposite polarity voltage pulse to said armature of duration effective for braking said armature at said programmed position.

4,408,858

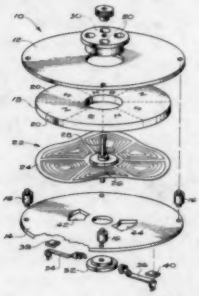
ELECTROMAGNETIC ACTUATOR HAVING A COMPLIANT ARMATURE

James K. Lee, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 219,168, Dec. 22, 1980, Pat. No. 4,333,722. This application Mar. 22, 1982, Ser. No. 360,494

Int. Cl.³ G03B *9/02, 9/62*

U.S. Cl. 354—234 **17 Claims**



1. An electromagnetic actuator of the type having means for forming a substantially planar magnetic gap and a flat armature positioned for movement in a magnetic gap, said actuator being characterized in that a portion of said armature is sufficiently compliant to contact and generally conform to the shape of said gap, and in that portions of said gap are substantially coextensive with said armature, for supporting said armature in a direction generally perpendicular to the path of said armature movement.

4,408,859

SPEED GOVERNOR FOR CAMERA

Hidehiko Fukahori, Yokohama; Tomonori Iwashita, Fuchu, and Katsunori Nakamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,293

Claims priority, application Japan, Dec. 29, 1980, 55-189239; Dec. 29, 1980, 55-189240; Dec. 29, 1980, 55-189241

Int. Cl.³ G03B *9/06*

U.S. Cl. 354—274 **6 Claims**

1. A speed governing device for a camera, said device comprising:

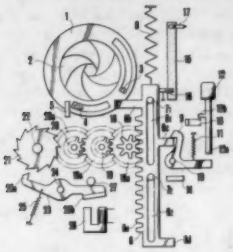
a moving member capable of being moved from an initial position thereof to a predetermined position;

a driving member for actuating said moving member, said driving member being arranged to be driven in association with a release action of the camera;

a first speed governing means interlocked with said driving member, said first speed governing means being arranged to synchronously drive said driving member with an increased speed; and

a second speed governing means interlocked with said first speed governing means, said second speed governing means being arranged to stabilize the driving speed of said

driving member in cooperation with said first speed governing means by braking the driving force of said driving



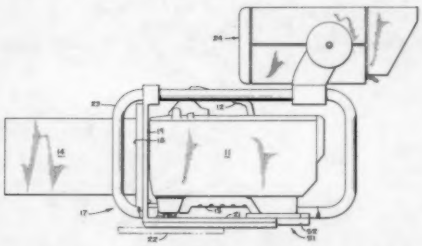
member, said second speed governing means utilizing an eccentric oscillating motion in applying a braking force to said driving member.

4,408,860

APPARATUS FOR A CAMERA MOUNT

Verl N. Barzee, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,727
Int. Cl.³ G03B *17/56*
U.S. Cl. 354—293 **7 Claims**



1. A camera mount of the type having a front plate attched to a lens which is attached to the front of the camera, a base plate extending therefrom and beneath the camera, and a manually-operable latching apparatus including clamping means and pressurizing means mounted on the base plate for respectively securing the bottom of the camera and for exerting a predetermined supporting force upwardly on said camera to counter the moment otherwise exerted by the camera on the lens, wherein:

said latching apparatus is adapted to control said means thereof to operate in the first sequence pressurizing-then-clamping during latching mode and the second sequence depressurizing-then-unclamping during the unlatching mode.

4,408,861

TRANSFER-PRINTING SHEET SEPARATING SYSTEM FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

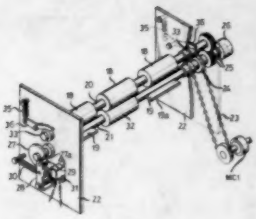
Minolu Hukuda, Kawasaki, and Tsutomu Watanabe, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Aug. 25, 1980, Ser. No. 181,054
Claims priority, application Japan, Aug. 31, 1979, 54-119134[U]; Oct. 30, 1979, 54-140184; Nov. 14, 1979, 54-147547
Int. Cl.³ G03G *15/00, 15/14*
U.S. Cl. 355—3 TR **4 Claims**

1. In an electrophotographic copying apparatus of the type having a sheet feeding device for pressing a transfer printing sheet through a feed path to the surface of a photosensitive member having a toner image formed thereon, the toner image being printed on the transfer-printing sheet from the photosensitive member at a transfer-printing station, and means for separating the transfer-printing sheet having the toner image printed thereon from the photosensitive member, an improved transfer-printing sheet separating system comprising:

a device for bending a leading end portion of the transfer-printing sheet located in the feed path of the transfer-printing sheet between the sheet feeding device and the transfer-printing station; and

means for actuating the device for bending the leading end portion of the transfer-printing sheet in synchronism with the passing of the leading end of the transfer-printing sheet,



said device for bending the leading end portion of the transfer-printing sheet comprises soft rollers and rotary members disposed in juxtaposed relation on opposite sides of the feed path of the transfer-printing sheet, said rotary members each being formed at a forward end with an edge angle parallel to the axis of the rotary member, said forward ends of said rotary members being spaced apart from the soft rollers when said device is inoperative and brought into engagement therewith when the device is operative, whereby the edge-angled forward ends of the rotary members bite into the soft roller to form a bend in the leading end portion of the transfer-printing sheet held between the soft roller and the rotary members, wherein said device for bending the leading end portion of the transfer-printing sheet further comprises at least one follower roller supported coaxially with the rotary members for rotation responsive to the rotation of the soft rollers.

4,408,862

DEVELOPING APPARATUS FOR ELECTROSTATIC COPYING MACHINE

Toshimasa Takano, Sagamihara; Masahiro Hosoya, and Reiji Murakami, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

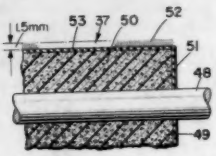
Filed Jan. 9, 1981, Ser. No. 223,928
Claims priority, application Japan, Jan. 18, 1980, 55/4320; Jan. 18, 1980, 55/4321; Jan. 18, 1980, 55/4325
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **9 Claims**

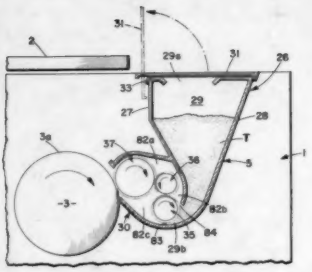
1. A developing apparatus for developing an electrostatic image on an electrostatic image bearing member, said apparatus comprising:

container means for storing toner; and

developing means for transporting the toner from said container means and applying it to the electrostatic image on said electrostatic image bearing member, said developing

means comprising a base made with elastic material and a fur formed on the peripheral surface of said base to





contact the surface of said electrostatic image bearing member,

said base comprising a roller-like core.

4,408,863

TRANSFER MEDIUM SEPARATING DEVICE

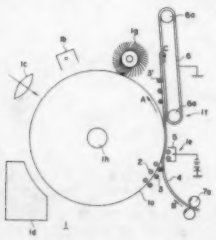
Yoshihiro Ogata, Yokohama; Koji Sakamoto, Tokyo; Harumi Takahashi, and Koji Hirakura, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 17, 1981, Ser. No. 284,454

Claims priority, application Japan, Jul. 21, 1980, 55-98697; Jul. 21, 1980, 55-98698; Jul. 21, 1980, 55-98699; Dec. 10, 1980, 55-177106[U]

Int. Cl.³ G03G *15/14, 15/22*

U.S. Cl. 355—3 TR **18 Claims**



1. A separating device for separating a transfer medium from a first carrier adapted to carry a toner image held electrostatically, said transfer medium having been previously brought into contact with said first carrier to transfer a toner image from said first carrier onto the front surface of said transfer medium by applying transfer charges of a polarity opposite to the polarity of the toner forming said toner image to the rear surface of the transfer medium, said separating device comprising

means including a second carrier formed of an electrically conductive material and having a portion located close to said first carrier for attracting the leading edge of said transfer medium by electrostatic attraction between said transfer charges on the rear surface of the transfer medium and charges on said second carrier;

potential application means for applying a potential in the range between a predetermined first level and a predetermined second level to said second carrier, said first level being capable of electrostatically attracting the leading edge of said transfer medium toward said second carrier from said first carrier and said second level

being capable of securely retaining the transferred toner image to the front surface of said transfer medium when said transfer medium is conveyed by said second carrier;

detecting means for detecting that said transfer medium has reached a reference position for supplying a detection signal; and

timing control means for controlling the timing for changing the potential applied to said second carrier by said potential application means from said first level toward said second level in response to said detection signal such that said second carrier is applied with a potential of said first level until the leading edge of said transfer medium has been separated from said first carrier and electrostatically attracted and securely held to said second carrier.

4,408,864

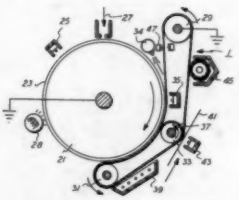
APPARATUS FOR INDUCING AN ELECTROSTATIC IMAGE IN A CONDUCTIVE MEMBER

James M. Hardenbrook, Altamonte Springs, Fla., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 142,565, Apr. 21, 1980, Pat. No. 4,318,972. This application Sep. 2, 1981, Ser. No. 298,701

Int. Cl.³ G03G *15/18*

U.S. Cl. 355—3 TE **17 Claims**



1. An apparatus for creating an electrostatic latent image in a sectionally conductive layer, said layer comprising an electrically insulating material having extended therethrough electrically conductive paths, comprising:

(a) a sectionally conductive layer in the form of a web entrained over rollers;

(b) a photoconductive surface rotatably mounted on a grounded electrode;

(c) means to electrostatically charge said photoconductive surface and expose said charged surface to an imagewise pattern of light;

(d) means to bring said photoconductive surface and said conductive layer into proximity with each other including means to maintain a predetermined distance between said surface and layer;

(e) means to ground said conductive paths on the side opposite said photoreceptor surface while in proximity to said photoreceptor surface;

(f) means to bring a grounded electrode adjacent said conductive layer coincident with means to separate said photoreceptor surface and said conductive layer;

(g) means to develop the latent image created on said conductive layer and to transfer said developed image to an image substrate;

(h) means to clean said conductive layer of untransferred residue of said developed image; and

(i) means to erase the electrostatic latent image on said photoreceptor and on said conductive layer.

4,408,865

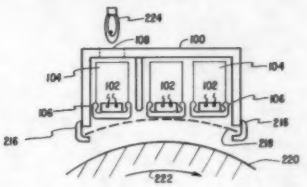
CORONA DISCHARGE DEVICE FOR ELECTROPHOTOGRAPHIC CHARGING AND POTENTIAL LEVELING

Thomas Camis, Boise; Paul R. Spencer, Meridian; Erwin H. Schwiebert, Eagle, and Robert R. Hay, Boise, all of Id., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Nov. 23, 1981, Ser. No. 324,339

Int. Cl.³ G03G *15/02*

U.S. Cl. 355—3 CH **5 Claims**



1. A corona discharge device for simultaneous potential leveling and uniform primary charging to a desired drum potential of a rotating photoreceptor drum of an electro-photographic printing device comprising:

a shield;

a plurality of corona wires within the shield, all of the corona wires being connected to receive a positive d.c. voltage, for producing positive ions;

a screen mounted on the shield for steering said positive ions toward said photoreceptor drum for charging said photoreceptor drum, the screen and the shield being maintained at a potential below the desired drum potential; and

a continuously illuminating light source for illuminating a first portion of said photoreceptor drum while said first portion of said photoreceptor drum is being charged by said positive ions.

4,408,866

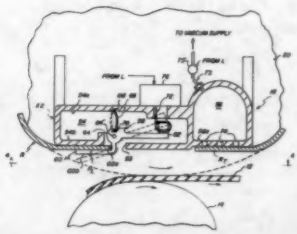
RECEIVER SHEET TRANSPORT WITH ALIGNMENT MEANS

Gary B. Gustafson, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,779

Int. Cl.³ G03G *15/00, 15/01*

U.S. Cl. 355—3 TR **8 Claims**



1. In apparatus for transferring related transferable marking particle images seriatim, from spaced areas on a member onto a receiver sheet, such apparatus including tow means for successively moving a receiver sheet into transfer relation with each of the related transferable images on the member, said tow means being adapted to capture the lead and trail edges of a receiver sheet so that a portion of the receiver sheet intermediate the lead and trail edges is self-supporting, and means for effecting transfer of such related images to the self-supporting portion of such receiver sheet in accurate superimposed register when such self-supporting portion is in transfer relation with the related transferable images on the member, the improvement wherein:

said tow means includes means operatively associated with an area on the member for positioning such lead edge relative to such area, to accurately align the receiver sheet with such area during image transfer.

4,408,867

OPTICAL SCANNING UNIT DRIVING DEVICE FOR ELECTROPHOTOGRAPHIC REPRODUCING APPARATUS

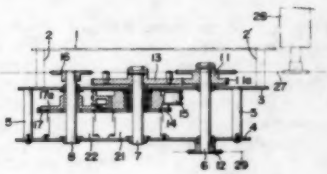
Yozo Fujii, Hachioji, and Takao Shiozawa, Akigawa, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,937

Claims priority, application Japan, Mar. 12, 1981, 56-34649

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—8 **2 Claims**



1. A driving device for optical scanning unit of electrophotographic reproducing apparatus comprising: a driving source; a plurality of gear means, each driven at different speed by the driving source; a first power transmission means to transmit the driving force to the optical scanning unit; and a second power transmission means which, in synchronism with the magnifying ratio selection operation, transmits the rotation of the specified gear means of the multiple gear means to the first power transmission means; whereby the specified gear means is mounted to the member easily accessible from outside of the electrophotographic reproducing apparatus.

4,408,868

DIGITAL PLATE MAKER SYSTEM AND METHOD

E. Raymond Thomas; Lysle D. Cahill, both of Dayton; John L. Tibbits, Centerville, all of Ohio; Kenneth D. Fraser, Scarboro, Canada; John F. Keane, Bellbrook, Ohio; Stanley C. Harting, Kettering, Ohio; George H. Kramer, Xenia, Ohio; Ronald J. Duke, Miamisburg, Ohio; Theodore A. Kessis, Dayton, Ohio; John C. Butler; Gary L. Frank, both of Centerville, Ohio, and John A. Lawson, Dayton, Ohio, assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Apr. 11, 1980, Ser. No. 139,462

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **39 Claims**

1. A method of imaging an electrophotographic member with an array of discharged elements to form latent graphics and text images thereon, the member thereafter being able to be used to reproduce the latent graphics and text images on a receptor by printing or the like, in which discharged elements individual to the graphics image and discharged elements individual to the text image are produced intermixed, the method comprising:

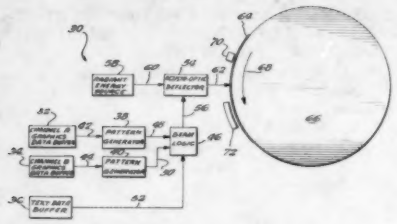
A. Acquiring graphics data in the form of a series of graphics

digital words from a source of such words representative collectively of the graphics image, the value of each word corresponding to a scaled density of an incremental area of the graphics image;

B. acquiring text data in the form of a series of text digital words comprised of bits from a source of such words representative collectively of the text image, the states of the bits of each data word corresponding to the binary densities of incremental areas of the text image;

C. charging said electrophotographic member;

D. providing a fine beam of radiant energy consisting of a plurality of rays which may be modulated on and off such that at times the beam includes no rays, and directing the beam against the electrophotographic member to cause



discharge of elements thereof, each ray discharging a single element when impinging against the member;

E. moving the beam and the electrophotographic member relative to one another to scan the entire surface of the member so that there will be discharged elements wherever said rays have impinged;

F. generating bit signals from at least the graphics data;

G. selecting certain ones of the bit signals in response to the text data; and

H. modulating said rays on and off in response to said selected certain ones of the bit signals;

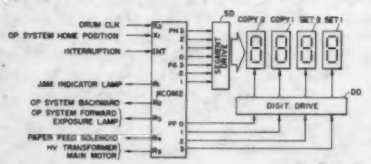
whereby independent graphics and text latent images may be laid down upon said electrophotographic member surface in one scanning thereof by said fine beam.

4,408,869

DIGITAL DISPLAY DEVICE CONTROLLED BY A MICROCOMPUTER

Masahiro Tomosada, Kawasaki, and Katsuyoshi Maeshima, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,109
Claims priority, application Japan, Feb. 8, 1980, 55-15084
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **21 Claims**



1. A display device, comprising:

a display unit;

serial signal generating means for generating signals at predetermined time intervals; and

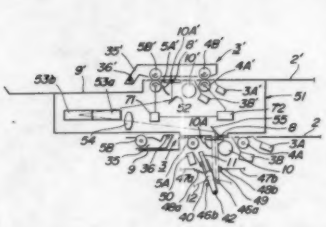
a microcomputer coupled to control said display unit to provide a flashing display, said microcomputer having a program interruption port for receiving the signal from said serial signal generating means, wherein the flashes of said display are synchronized with said serial signal at a predetermined ratio.

4,408,870

DUPLICATING SYSTEM COMPRISING ELECTROPHOTOGRAPHIC COPYING APPARATUS AND OPTION DEVICES

Masaji Nishikawa; Kiyoshi Miyashita, and Muneo Kasuga, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,740
Claims priority, application Japan, May 9, 1980, 55-61300
The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **27 Claims**



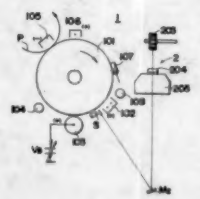
1. A duplicating system comprising an electrophotographic copying apparatus which includes first optical scanning means for making a slit exposure, first means for feeding a first document to be copied at a first speed with respect to said first optical scanning means, photosensitive means for forming an electrostatic latent image corresponding to the image of document, and means for forming a duplicated copy with the aid of said latent image; and an option device which includes means for detachably mounting the option device onto the copying apparatus, second optical scanning means for making a slit exposure, second means for feeding a second document to be copied at a second speed with respect to said second optical scanning means and optional optical means for projecting the image of second document onto said photosensitive means of the copying apparatus; wherein said first feeding means in the copying apparatus and second feeding means in the option device are so constructed that the first and second documents are fed in the same direction.

4,408,871

CONTROL SYSTEM FOR ELECTROSTATIC RECORDING APPARATUS

Hiroaki Kojima, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1982, Ser. No. 358,377
Claims priority, application Japan, Mar. 19, 1981, 56-40875
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **15 Claims**



1. In an electrostatic recording apparatus having a photosensitive member relatively movable in a secondary scan direc-

tion, a charging device for charging the surface of the photosensitive member, means for exposing the charged surface of the photosensitive member by line-scanning in a primary scan direction with optical signals subject to a switching control to form a latent electrostatic image, and a control system for controlling the surface potential of the photosensitive member, the control system comprising:

a detecting means for detecting the surface potential of the photosensitive member at a position subsequent to the means for exposing;

first control means for controlling application of charging power to the charging device to regulating the charged potential to a predetermined charging value in response to the detected value of the detecting means in a first situation with the photosensitive member and the charging device in operation and at least that portion of the photosensitive member opposite to the detecting means not being exposed;

second control means for controlling an exposing power of the exposing means after completion of said first control means operation for regulating the surface potential following exposure to a predetermined potential in accordance with the detected value of the detecting means in a second situation with the photosensitive member and the charging device in operation and at least that portion of the photosensitive member opposite to the detecting means is exposed; and

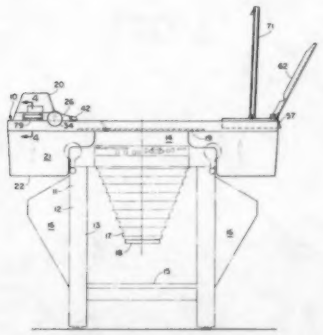
a control device for controlling the line-scanning operation of the exposing means and the first and second control means to effect the first and second control operation in that order.

4,408,872

COMBINED STORING, TRANSPORTING, EXPOSING AND PROCESSING APPARATUS FOR CAMERA

Quentin D. Vaughan, Hollywood, Fla., assignor to Visual Graphics Corporation, Tamarac, Fla.

Filed Mar. 1, 1982, Ser. No. 353,637
Int. Cl.³ G03B *29/00*
U.S. Cl. 355—28 **20 Claims**



1. Apparatus for use in combination with a camera having an object plane and an image plane comprising:

a. an elongated table coupled to the camera having a top surface parallel to the image plane of the camera;

b. a film transport section slidably carried on the table at one end thereof;

c. a light tight cassette on the transport section;

d. a supply of imaging film in said cassette;

e. means carried by the transport section to advance at least a portion of the imaging film from the cassette on to the table;

f. A translucent platen carried by the table to receive light directed through the camera from the object plane;

g. an elongated flexible sheet of light filtering material yieldably secured at one end within the transport section and adapted to be extended from said transport section along the table to overlie the platen;

h. control means to advance the imaging film across the table and beneath the light filtering material to overlie the platen;

i. at least one groove in the top surface of the table adjacent the platen and beneath the elongated flexible sheet;

j. a vacuum source coupled to said groove;

k. means to control the vacuum source to evacuate air from the space between the flexible sheet and the platen to bring the film into uniform contact upon the platen;

l. a processing station carried by the table opposite the transport section;

m. means to interrupt the vacuum source to release the atmospheric pressure against the flexible sheet and the film; and,

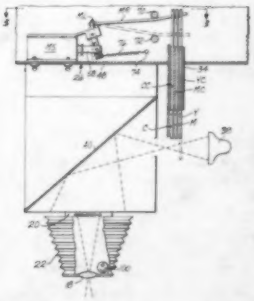
n. film advancing means carried by the transport section to urge the film into the processing station as the transport section is advanced along the table in the direction of said processing station.

4,408,873

COLOR CORRECTION ADAPTER FOR PHOTOGRAPHIC ENLARGERS

Ervin D. Labrum, 15828 4th Ave., SW., Seattle, Wash. 98166

Filed Dec. 8, 1980, Ser. No. 214,194
Int. Cl.³ G03B *27/73, 27/74*
U.S. Cl. 355—36 **24 Claims**



1. An exposure system for a color enlarger, comprising:

three separate color filters mounted to be independently movable into and outfrom the light path between a lamp and a supported color transparency in a color enlarger;

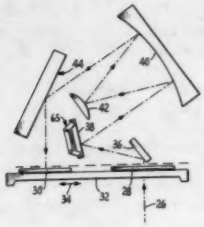
control means for sequencing said filters into and outfrom the light path to provide three separate exposures for the colors red, green and blue, including means providing an exposure time for each color exposure that is based on the color density of a standardized transparency, and balance means for adjusting the exposure time for each color exposure to compensate for differences in color density between the standardized transparency and a transparency in the color enlarger from which a color print is to be made including light intensity sensor means in the enlarger between the transparency and the lens, for measuring during each exposure the intensity of colored light passing through the transparency.

4,408,874

PROJECTION ALIGNER WITH SPECIFIC MEANS FOR BENDING MIRROR

William Zinky, Los Altos, and Larry Rosenberg, San Jose, both of Calif., assignors to Computervision Corporation, Santa Clara, Calif.

Filed May 7, 1981, Ser. No. 261,674
Int. Cl.[3] G03B 27/68
U.S. Cl. 355—52 3 Claims



1. In a projection printer wherein the image of a mask is projected through a narrow slit having a longitudinal axis extending from one side of the mask to the other and the image of the mask moves at a right angle to the longitudinal axis of the slit to expose the entire mask by means including at least one plane mirror into a sensitized wafer and wherein said mirror is anamorphically distorted to alter the image size in a direction perpendicular to the longitudinal axis of said slit, the improvement comprising:

a. means for gripping said plane mirror only along points of contact which are parallel with the longitudinal axis of said slit whereby said mirror is held in a strain-free relationship, and whereby said mirror can only be deformed about axes parallel to the longitudinal axis of said slit;

b. frame means supported by said mirror, said frame means extending across the back of said mirror in a direction perpendicular to the longitudinal axis of said slit;

c. pressure means extending between said frame means and said mirror for distorting said mirror anamorphically about one or more axes parallel to the longitudinal axis of said slit.

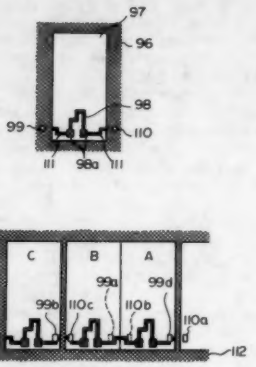
4,408,875

METHOD OF PROJECTING CIRCUIT PATTERNS

Teiji Majima, Komae, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 31, 1981, Ser. No. 333,814
Claims priority, application Japan, Dec. 29, 1980, 55-187235; Apr. 10, 1981, 56-53831
Int. Cl.[3] G03B 27/42
U.S. Cl. 355—53 10 Claims

1. A method of projecting circuit patterns which uses a photosensitive layer formed on a substrate and an exposing mask which has mask patterns formed within a transparent area thereof, said exposing mask and said substrate being relatively moved by predetermined pitch lengths while said mask patterns are printed on said photosensitive layer at every relative position, said printed mask patterns formed on said photosensitive layer a plurality of element patterns each of which comprises at least two adjacent circuit patterns, said method characterized in that said exposing mask comprises a first transparent area and second transparent areas which are disposed to the two sides of said first transparent area along the direction of movement of said substrate; said pitch length comprises pitch length A between adjacent printed mask patterns within said element pattern and pitch length B between adjacent printed mask patterns of the adjacent element patterns, said pitch length A and said pitch length B, being kept at constant values and said pitch length B being greater than said pitch length A; and mask patterns of said second transparent areas are printed on portions of areas of said photosensitive layer which correspond to said first transparent areas printed one pitch length before and after the projection of said mask



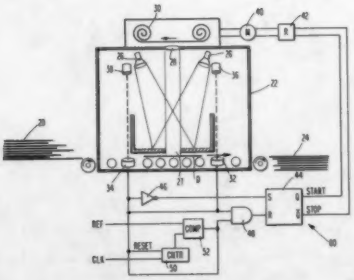
patterns of said second transparent area, thereby forming said element pattern including different portions from said mask patterns of said exposing mask.

4,408,876

METHOD AND APPARATUS FOR MICROFILMING DOCUMENTS OF VARIED LENGTH

Kurt A. Steidle, Basel, Switzerland, assignor to Motion Technology Corporation, Aston, Pa.

Filed Nov. 27, 1981, Ser. No. 325,349
Int. Cl.[3] G03B 27/44
U.S. Cl. 355—54 1 Claim



1. Apparatus for photographing documents onto microfilm comprising means for advancing the document to be microfilmed, means for advancing the microfilm, synchronization means for control of the movement of the film and document, whereby said film advancement is begun with introduction of the document, means for producing a signal at the termination of the document, means to measure the length of the moved forward film and means for control of the advancement of the film after the production of said signal, such that the film is advanced in lengths corresponding to whole multiples of a pre-established minimum length.

4,408,877

DEVICE FOR HYDRODYNAMIC FOCUSSING OF A PARTICLE-SUSPENSION IN A LIQUID FLOW CYTOPHOTOMETER

Tore Lindmo, Sofiemyr, and Harald B. Steen, Oslo, both of Norway, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

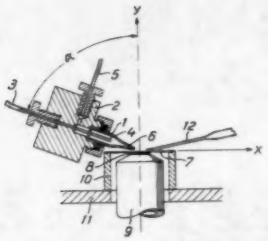
PCT No. PCT/EP80/00021, § 371 Date Dec. 10, 1980, § 102(e) Date Dec. 8, 1980, PCT Pub. No. WO80/02198, PCT Pub. Date Oct. 16, 1980

PCT Filed Apr. 10, 1980, Ser. No. 220,038

Claims priority, application Norway, Apr. 10, 1979, 791228

Int. Cl.³ G01N *33/48*

U.S. Cl. 356—38 10 Claims



1. A device for carrying out liquid flow cytophotometry, comprising:

an optical excitation and detection system having an optical axis and an object plane;

a plate having a surface which is positioned in the object plane of said optical system to define a measuring area and which is open in relation to the surrounding atmosphere; and

means for hydrodynamically focussing a suspension of cells or particles and for openly directing the suspension through the surrounding atmosphere toward and against said measuring area defined by the surface of said plate to produce a laminar flow of the suspension on said surface, said suspension being focussed into a stream wherein the cells or particles pass by one after another through the measurement area.

4,408,878

METHOD AND APPARATUS FOR MEASURING EMISSIVITY

Jean-Paul F. Fischbach, Neupre, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Dec. 16, 1980, Ser. No. 216,866

Claims priority, application Belgium, Dec. 17, 1979, 6/47038

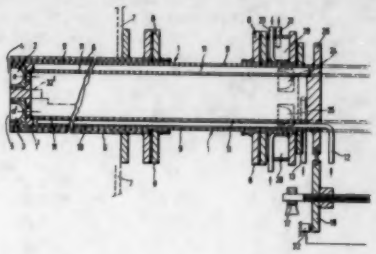
Int. Cl.³ G01J *5/04, 5/10*

U.S. Cl. 356—43 11 Claims

1. Apparatus for measuring the emissivity of a surface of a product, comprising

(a) an elongated support member, a sensor unit mounted at one end of said support member comprising two chambers disposed side-by-side, one of said chambers being substantially totally reflecting and the other being substantially totally absorbing, the chambers being open at one end facing outwardly of said one end of said support member so that they are exposable to the product, and a pyrometer arranged in each respective chamber and directed towards the open end thereof, and

(b) displacement means operatively engaging the other end of said support member for advancing said support member and sensor unit towards the product, placing it in



proximity to the product, and withdrawing it from the product.

4,408,879

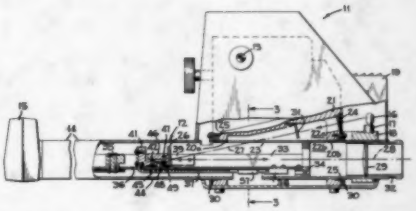
BEAM PROJECTOR FOR WHEEL ALIGNER

Marshall P. Ragan, Mayflower, Ark., assignor to FMC Corporation, Chicago, Ill.

Filed May 8, 1981, Ser. No. 261,441

Int. Cl.³ G01B *11/26;* G02B *23/10*

U.S. Cl. 356—155 4 Claims



1. An aimable light projection system for measurement of vehicle wheel position in a toe plane wherein a beam of light is directed from an alignment head mounted on one wheel of a vehicle toward a target mounted on another wheel of the vehicle, comprising

a framework,

a passage having first and second angularly disposed lengths extending through said framework and having a reference axis therethrough,

a light source mounted at one end of said first passage length providing a light beam therealong,

a reticle mounted in said passage,

a projection lens mounted near the other end of said second passage length so that an image of said reticle is focussed at the target,

a condensing lens in said passage operating to focus an image of said light source substantially at said projection lens,

a reflector disposed substantially at the intersection of said first and second passage lengths operating to receive and reflect said light beam along said second length,

means for pivotally mounting said reflector at the interestion of said passage lengths for movement about an axis substantially perpendicular to the toe plane,

a cam positioned to bear against said means for pivotally mounting whereby cam movement induces said reflector pivotal movement,

manually accessible means for moving said cam,

and position sensing means coupled to said manually accessible means, whereby a signal indicative of the angular position of said light beam and the displacement of said

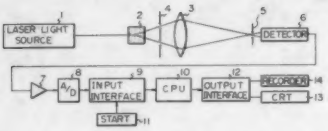
recticle image relative to said passage reference axis is provided.

4,408,880

LASER NEPHELOMETRIC SYSTEM

Yashuhiro Tsuji, Kawaguchi; Kiyoshige Wakabayashi, Ohmiya, and Mitsuo Watanabe, Machida, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,578
Int. Cl.³ G01N *21/00*
U.S. Cl. 356—338 **5 Claims**



1. A laser nephelometric system for measuring the concentration of substances to be measured in a solution comprising:

(a) a laser unit for applying a beam of laser waves to the solution to obtain the light waves scattered therein,

(b) means for receiving said scattered light waves to convert into corresponding electric signals in an analogue form,

(c) means for converting said analogue signals to digital signals,

(d) means for storing a predetermined number of said digital signals as a group of data elements,

(e) means for searching a minimum data element out of said group as a first lower limit,

(f) means for obtaining a first upper limit which is greater than and determined by said minimum data element, thus defining a first range,

(g) means for selecting those data elements only that are within said first range, thus defining a first set of selected data elements,

(h) means for averaging said first set of selected data elements to obtain a first average value,

(i) means for obtaining second upper and lower limits from said first average valuc and a deviation parameter in said first set of selection data elements, thus defining a second range including said first average value,

(j) means for selecting those data elements only that are within said second range, thus defining a second set of selected data elements,

(k) means for averaging said second set of selected data elements to obtain a second average value which is used as a measured value of the intensity of scattered light due to the substances to be measured.

4,408,881

HOLOGRAPHIC INSPECTION TECHNIQUE

Joseph F. Clarady, Jr., Tequesta; Karen L. Jessee, Jupiter, and Joe L. Bearden, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,504
Int. Cl.³ G01B *9/029*
U.S. Cl. 356—347 **4 Claims**

1. A holographic test apparatus for testing a test object comprising:

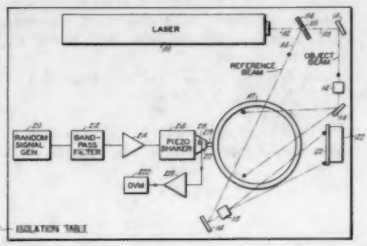
means for generating an optical object beam and reference beam;

means for exposing a test object to said object beam;

means for exposing a photosensitive detector simultaneously to said reference beam and to radiation emanating from said test object for a predetermined exposure time;

signal generating means for generating electrical signals having frequencies randomly distributed within a frequency range;

filter means for passing a portion of said randomly distributed frequencies within a predetermined frequency range to form a driving signal;



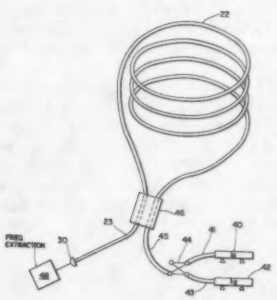
means responsive to said driving signal for mechanically shaking, during said exposure time, said test object with accelerating forces having a predetermined average strength.

4,408,882

OPTICAL GYROSCOPE WITH TIME DEPENDENT WAVELENGTH

Sang K. Sheem, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1981, Ser. No. 280,107
Int. Cl.³ G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **11 Claims**



1. A Sagnac rotation measurement device comprising:

means for generating a plurality of different beams of electromagnetic energy with each beam having a different wavelength;

a light path circuit including a plurality of turns of optical path in or parallel to a given plane;

means for splitting a beam into two beams and for directing one of said two beams to travel in a clockwise direction around said light path circuit and directing the other of said two beams to travel in a counter-clockwise direction around said light path circuit, and for recombining said two beams after having traversed through their respective directions in said light path circuit to produce electromagnetic wave interference;

means for alternately gating each of said plurality of different wavelength beams from said generating means to said splitting means at a frequency substantially higher than the rates of change of phase due to rotation in the plane of said light path circuit and due to system noises; and

means for extracting a signal at said wavelength gating frequency from said interference pattern in order to detect a rotation-caused phase change therefrom.

4,408,883

APPARATUS FOR INSPECTING AVERAGE SIZE OF FUNDAMENTAL PATTERNS

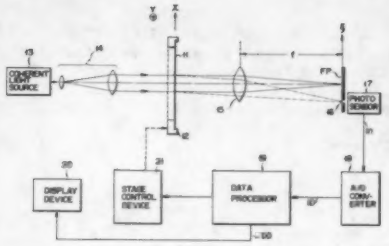
Akito Iwamoto, Kamakura, and Hidekazu Sekizawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 4, 1981, Ser. No. 240,603

Claims priority, application Japan, Mar. 6, 1980, 55-27321

Int. Cl.³ G01B *11/00, 9/02*

U.S. Cl. 356—355 **40 Claims**



1. An apparatus for inspecting an object, comprising:

Fourier transform means for providing an output data corresponding to a Fourier transform pattern of a given region of an object containing substantially regularly arranged fundamental patterns;

extractor means coupled to the Fourier transform means, for extracting a single magnitude data representing a spatial frequency component of the order n from the output data, the magnitude of the order n component changing with variation of the size of fundamental patterns; and

first means coupled to the extractor means, for determining the average size of fundamental patterns according to the single magnitude data;

wherein the order n spatial frequency component is selected so that the rate of change or the differential coefficient of the magnitude of the order n component with respect to the variation of the size of patterns is substantially maximum.

4,408,884

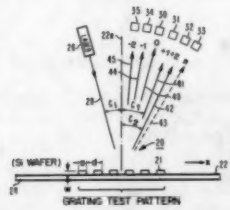
OPTICAL MEASUREMENTS OF FINE LINE PARAMETERS IN INTEGRATED CIRCUIT PROCESSES

Hans P. Kleinknecht, Bergdietikon, Switzerland; William E. Ham, Mercerville, N.J., and Heinrich Meier, Urdorf, Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,448

Int. Cl.³ G01B *11/02*

U.S. Cl. 356—355 **21 Claims**



21. A method for optically monitoring the image transfer process for an LSI device by:

preparing by a given process a product wafer or mask with selected patterns extending over a selected area thereon, and

preparing by said given process a test sample comprising a specimen monitor mask or wafer having a diffraction pattern extending over an area thereon substantially equal to the pattern area of said product wafer or mask,

gross defects in the diffraction pattern of said specimen monitor mask or wafer being visually discernible and being indicative thereby of similar defects at corresponding area portions on said product wafer or mask.

4,408,885

APPARATUS FOR THE AUTOMATIC ALIGNMENT OF TWO SUPERIMPOSED OBJECTS, E.G. A SEMICONDUCTOR WAFER AND MASK

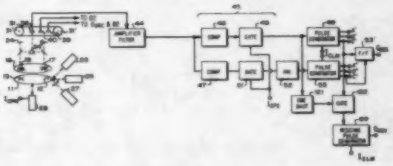
Karl-Heinz Johannsmeier, Mountain View; Paul E. Stoft, Menlo Park, and Tor G. Larsen, Cupertino, all of Calif., assignors to Kasper Instruments, Inc., Sunnyvale, Calif.

Division of Ser. No. 839,324 Oct. 4, 1977, Pat. No. 4,259,019, which is a division of Ser. No. 650,976, Jan. 21, 1976, Pat. No. 4,070,117, which is a division of Ser. No. 305,861, Jun. 12, 1972, Pat. No. 3,955,072, which is a continuation of Ser. No. 126,597, Mar. 22, 1971, abandoned. This application Jan. 13, 1981, Ser. No. 224,915

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.³ G01B *11/00;* **G06F** *15/46*

U.S. Cl. 356—401 **2 Claims**



1. A system for aligning first and second relatively movable objects, where the first object has a pair of spaced alignment patterns thereon, the second object has a corresponding pair of spaced alignment patterns thereon, each of said alignment patterns on the first and second objects comprises at least one pair of non-parallel lines, and each of said alignment patterns on the first object is disposed in a preselected alignment position relative to the corresponding alignment pattern on the second object when the first and second objects are aligned; said system comprising first means for scanning images of said lines of each of said alignment patterns on the first object and of said lines of the corresponding alignment pattern on the second object in a straight line and in a single direction; second means for sensing the scanned images of said lines of each of said alignment patterns on the first object and of said lines of the corresponding alignment pattern on the second object to produce signals indicative of the position of each of said alignment patterns on the first object relative to the corresponding alignment pattern on the second object; and third means for changing the relative positions of the first and second objects to bring each of said alignment patterns on the first object into the preselected alignment position relative to the corresponding alignment pattern on the second object.

4,408,886

MIXING EQUIPMENT

John D. Sampson, and David J. W. Sparrow, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 116,526, Jan. 29, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,491

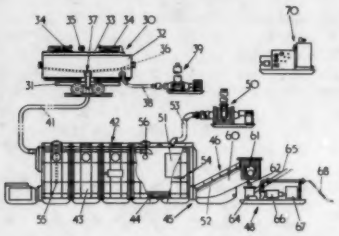
Claims priority, application United Kingdom, Feb. 2, 1979, 7903693

Int. Cl.³ B01F *15/02;* **B28C** *5/06*

U.S. Cl. 366—13 **9 Claims**

1. Equipment for mixing powdered or particulate cement

with a liquid, comprising a mobile fluidised storage container for the powdered or particulate cement, the fluidised storage container having a floor, an outlet and an air permeable deck arranged above the floor for supporting the powdered or particulate cement, a blower unit detachably connectable to the container for supplying fluidising air to the container in the space between the floor and deck, said compressed air passing through the deck to fluidise the powdered or particulate cement, a receiver unit independent of the container being selectively connectable to and disconnectable from the container



for being supplied with and for accumulating cement from the container, a mixer unit for mixing the cement with liquid, conveyor means for feeding accumulated cement from the receiver unit to the mixer unit, liquid feed means for feeding liquid to the mixer, and pump means from the mixer unit for delivering a mixture of cement and liquid from the mixer unit to a point of use remote from said mixer unit whereby a succession of mobile fluidised storage containers can be connected to the receiver unit while said feeding of accumulated cement ensures a continuous flow of cement to the mixer unit.

4,408,887

CONTINUOUS KNEADER

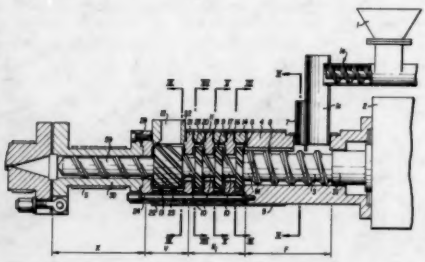
Kishihiro Yamaoka, 1-1001, Ikedakita-machi 24, Neyagawa-shi, Osaka, Japan

Filed Apr. 20, 1982, Ser. No. 370,213

Claims priority, application Japan, Dec. 7, 1981, 56-182630[U]; Dec. 7, 1981, 56-197368

Int. Cl.³ B29B *1/06*

U.S. Cl. 366—75 **5 Claims**



1. A continuous kneader comprising a rotary shaft in the form of a screw and rotatable within a cylinder for transporting a fluid axially thereof, a plurality of rotary disks mounted on the shaft and each formed on each side surface thereof with radial projections and recesses arranged alternately, and fixed disks provided on the cylinder and arranged on the opposite sides of each rotary disk coaxially therewith as opposed thereto, each of the fixed disks being formed on each side surface thereof with radial projections and recesses arranged alternately, the boundary between and defining each projection and the recess adjacent thereto on at least one of the rotary disk and the fixed disk being inclined from the radial direction so that the material supplied from a space between the rotary shaft and the inner surface of the cylinder to the space between the rotary disk and the fixed disk is passed over the outer periphery of the rotary disk toward the axis of the shaft into the space between the rotary disk and the fixed disk immediately adjacent thereto, the projections and the recesses being so formed as to reduce the space between each rotary disk and the fixed disk immediately adjacent thereto from disk to disk toward the forward end of the cylinder.

4,408,888

DOUBLE-WORM EXTRUSION PRESS

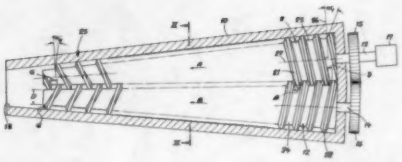
Wilhelm Hanslik, Vienna, Austria, assignor to American Maplan Corporation, McPherson, Kans.

Filed Nov. 9, 1981, Ser. No. 319,657

Claims priority, application Austria, Nov. 10, 1980, 5508/80

Int. Cl.³ B29B *1/10*

U.S. Cl. 366—83 **1 Claim**



1. A double-worm extrusion press, especially for high viscosity thermoplastic material comprising:

an elongated worm housing formed with an outlet at one end thereof;

a pair of meshing worms conically tapering toward said end, each of said worms having a flight with flank angle between 10° and 25° rising from a root of the respective worm and extending spirally over the length thereof, a plurality of turns of each flight forming a discharge zone at an extremity of the worm proximal to said end, the flight height/worm diameter ratio over said zones decreasing in a direction opposite the direction of flow of said material through said housing, the height of the flight of each worm at the downstream end of each zone being between 26 and 30% of the worm diameter at said downstream end; and

means for counter-rotating said worms to advance a thermoplastic material through said housing, substantially adiabatically through said zones, and out of said housing through said opening, the worm flights defining between them flank gaps which progressively increase in the direction of taper of said worms, said flank angle continuously diminishing in the direction of taper of each worm and the flanks of the two worms including angles between them.

4,408,889

UNIVERSAL BLENDING SILO

Ivan A. S. Z. Peschl, Kennedylaan 8, 6029 RE Sterksel, Netherlands

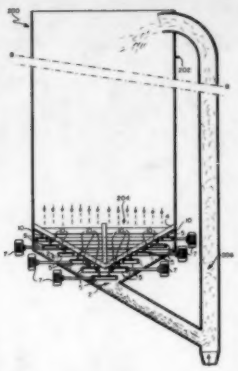
Division of Ser. No. 99,038, Nov. 30, 1979, Pat. No. 4,345,842. This application Sep. 21, 1981, Ser. No. 304,208

Int. Cl.³ B01F *5/00, 5/10, 5/26, 15/02*

U.S. Cl. 366—113 **28 Claims**

1. A universal blending system for blending the material contents of a silo, said silo having interior side walls and a blending bottom, said system blending bottom comprising a fixed support frame connected to said silo side walls, a collection hopper, a plurality of spaced apart blending rings positioned adjacent each other in an array above said collection hopper, said rings being hingedly connected to said frame in said array, a generally circular slot opening being formed between an adjacent pair of rings in said array for enabling controllable flow of said material between said adjacent rings

into said collection hopper, and vibrator means operatively connected in said system for vibrating said rings and said frame relative to each other at a predetermined amplitude and frequency for disturbing the steady state condition of said material between said adjacent pair of rings for providing said controllable flow, the intensity of said vibratory movement of each of said rings around the symmetric axis of said rings controlling the rate of flow of said material through each of said circular slot openings.

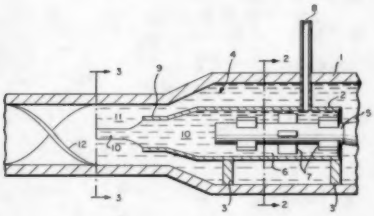


4,408,890

PIGMENT PRE-BLENDING MIXHEAD ATTACHMENT

Charles H. Beckmann, Getzville, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1981, Ser. No. 242,582
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—155 **3 Claims**



1. A mixhead attachment for preparing a viscous fluid for marbled pigmentation, said attachment being adapted to convey said fluid from a mixhead to an in-line motionless mixer, said attachment comprising:

a generally cylindrical housing having an inlet end adapted for attachment to said mixhead and an outlet end adapted for attachment to said motionless mixer;

an open-ended, generally cylindrical tube coaxially positioned within said housing and radially separated therefrom, providing a first annular passage for the flow of a portion of said fluid;

means for securing said tube within said housing;

a mixing shaft rotatably mounted within said tube and radially separated therefrom, providing a second annular passage for the flow of the balance of said fluid;

a plurality of fins mounted on said mixing shaft and partially extending into the second annular passage;

means for rotating said mixing shaft; and

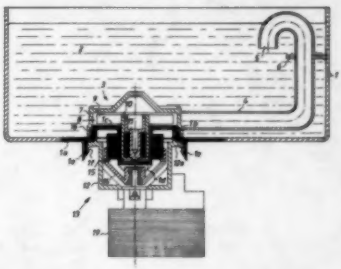
means for allowing the introduction of pigment into said second annular passage wherein substantially complete pigmentation of said balance of said fluid occurs.

4,408,891

ARRANGEMENT FOR DEVELOPING PHOTOGRAPHIC LAYER CARRIERS

Günter Schirk, and Alfons Kastl, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,671
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029044
Int. Cl.³ B01F *5/12, 13/08*
U.S. Cl. 366—265 **18 Claims**



1. An arrangement for developing photographic layer carriers, comprising at least two containers each for accommodating a treating medium and having an uninterrupted wall; means for circulating the treating medium in each of said container and including a pump which has a first part formed by said uninterrupted wall of each of said containers and a second part associated with said first part, said pump having a rotary body located inside each of said containers; magnetic means for each of said containers and imparting rotation to said rotary body of each of said pumps, said magnetic means being located outside each of said containers and magnetically acting upon said rotary body of each of said pumps so as to rotate the same, said magnetic means including a driven magnetic force-transmitting element located outside each of said containers and acting upon said rotary body of each of said pumps; and common means for driving the force-transmitting elements of both magnetic means for both said circulating means of both said containers, said driving means including a gear provided on each of said force-transmitting elements, an electric motor, and a motion-transmitting element arranged between said electric motor and the gears of both said force-transmitting elements and rotating both said gears and thereby both said force-transmitting elements.

4,408,892

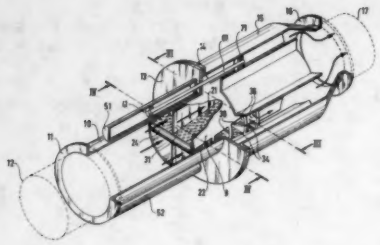
APPARATUS FOR INCREASING THE HOMOGENEITY OF A FLUID FLOW IN A PIPE

Gilles Combes, Grenoble, and Raymond Kuntz, Saint Ismier, both of France, assignors to Societe Anonyme dite: Alsthom-Atlantique, Paris, France

Filed May 5, 1982, Ser. No. 375,157
Claims priority, application France, May 5, 1981, 81 08883
Int. Cl.³ B01F *3/08, 5/06*
U.S. Cl. 366—337 **7 Claims**

1. Apparatus for increasing the homogeneity of the mixture of fluids which flow in the same pipe, the apparatus operating by dividing the flow into multiple converging jets, wherein the apparatus comprises a tubular structure for coupling in a pipeline end for end between pipe sections, a cylindrical sheath housed in said tubular structure, said sheath being fitted with two diverging longitudinal perforated plates merging at their

upstream ends so as to define two inlet chambers between which fluid flowing into the apparatus from the pipe is distributed, a plurality of partitions which are substantially perpendicular to the axis of the sheath partitioning the space between



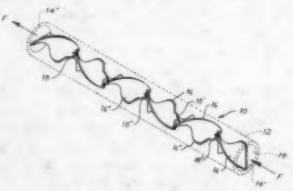
the plates so as to constitute a plurality of outlet cells in which jets of fluid from the perforations through the plates converge, and said sheath having openings formed therein laterally to each side thereof for the lateral removal of the fluids which mix in the cells.

4,408,893

MOTIONLESS MIXING DEVICE

William T. Rice, III, Charlotte, N.C., assignor to Luwa A.G., Zurich, Switzerland

Filed Apr. 28, 1982, Ser. No. 372,464
Int. Cl.³ B01F *5/06*
U.S. Cl. 366—339 **21 Claims**



1. A device for intermixing a plurality of fluids comprising a body having formed therethrough a cylindrical bore having a fluid entrance end and a fluid exit end for flow therethrough of said fluids, two oppositely-curved primary helical baffles disposed longitudinally in said bore in axially spaced relation and respectively extending transversely across said bore to divide it for successively dividing and oppositely turning said fluids as they flow therethrough, and a connecting helical baffle of substantially smaller corresponding transverse dimension than said primary baffles extending longitudinally therebetween centrally in said bore and being curved oppositely of the primary baffle on the entrance end of said connecting baffle to obstructingly deflect the portion of said fluids flowing centrally of said bore along said entrance end primary baffle for diffusingly turbulent redirection of said fluids portion in conjunction with dividing and turning of said fluids by the other primary baffle, thereby enhancing the mixing of said fluids.

4,408,894

MULTIPLE SELECTABLE TIMER

Richard E. Hemperly, 2544 Unicornio St., Carlsbad, Calif. 92008

Filed Apr. 9, 1982, Ser. No. 366,830
Int. Cl.³ G04F *1/04*
U.S. Cl. 368—93 **10 Claims**

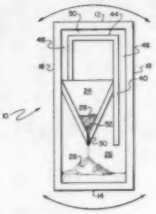
1. A timing device comprising:

a closed housing having a longitudinal axis,

a measured quantity of flowing medium contained within said housing,

first walls means in said housing separating the interior thereof into a timing reservoir, and a catch chamber displaced along said longitudinal axis from said timing reservoir,

said first wall means includes means defining a timing orifice for communicating a quantity of said flowing medium within said timing reservoir to said catch chamber, and



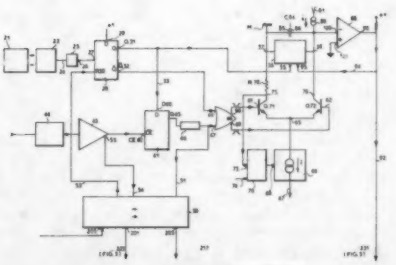
second wall means defining a generally U-shaped restricted metering passage having one leg extending parallel to said longitudinal axis along one side of said housing for communicating with said catch chamber and another leg extending parallel to said longitudinal axis along the other side of said housing for communicating with said timing reservir for controllably conveying a predetermined measured portion of said measured quantity of flowing medium between said catch chamber and said timing reservoir upon complete rotation of said housing in a selected direction.

4,408,895

APPARATUS FOR ACCURATELY TIMING AN EVENT RELATIVE TO CLOCK SIGNALS

Michel Geesen, Antony, France, assignor to Electronique Marcel Dassault, Paris, France

Filed Oct. 30, 1981, Ser. No. 315,606
Claims priority, application France, Oct. 31, 1980, 80 23404
Int. Cl.³ G04F *8/00*
U.S. Cl. 368—118 **11 Claims**



1. Apparatus for timing an event relative to a time reference provided by clock signals, the apparatus comprising:

an integrator circuit;

integrator signal providing means for providing a charge signal and a discharge signal to said integrator circuit with respective signal amplitudes such that the charge rate is high relative to the discharge rate;

control means for causing the charge signal to be applied to the integrator circuit in response to an event pulse representing the position in time of the event to be timed, and to halt the application of the charge signal to said integrator

in response to a clock signal following said pulse and for causing the integrator circuit to begin discharging;

a detector to detect when said integrator circuit has discharged to a predetermined discharge level; and

time measuring means for measuring the time that elapses between the beginning of discharge and the detection of said predetermined discharge level;

said means for providing the charge signal comprising first current producing means for causing a first current to pass through a by-pass circuit independent of the integrator circuit, and switching means to divert said first current from the by-pass circuit to the integrator circuit in response to said event pulse;

said switching means comprising first and second substantially identical switching devices connected respectively to said by-pass circuit and to said integrator circuit and independently controlled by said control means in phase opposition to each other to simultaneously halt said first current passing through said by-pass circuit and to cause it to pass through said integrator circuit in response to said event pulse, and vice-versa in response to said following clock signal.

4,408,896

CORRECTING MECHANISM FOR HYBRID DISPLAY TIMEPIECE

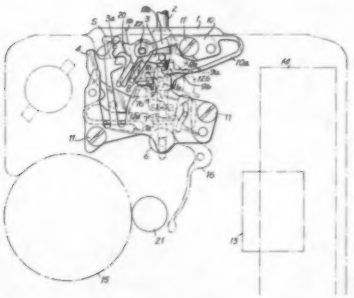
Toshimasa Ikegami, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,150

Claims priority, application Japan, Jun. 6, 1980, 55-78813

Int. Cl.³ G04B *19/24, 19/00*; G04C *3/00*; G04G *9/00*

U.S. Cl. 368—185 **16 Claims**



1. A correcting mechanism for a hybrid display timepiece including both an analog display and digital display, comprising:

a shaft mounted for rotation, and for translation in the directions of the longitudinal axis of said shaft;

first actuatable means for correcting said digital display;

second actuatable means for correcting said analog display;

a correcting member, said correcting member being slidably mounted on said shaft and for rotation therewith, said correcting member having a first portion adapted to actuate said first means for correcting said digital display and a second portion adapted for actuating said second means for correcting said analog display;

means cooperating with said shaft for translatting said correcting member, when said shaft translates, whereby said correcting member is selectively positioned to engage one of said first and second means for actuating.

4,408,897

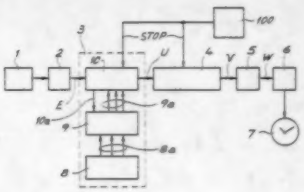
ELECTRONIC TIMEPIECE HAVING A DIGITAL FREQUENCY CORRECTION CIRCUIT

Claude Mutrux, Cernier, Switzerland, assignor to Ebauches Electroniques S.A., Marin, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,390

Int. Cl.³ G04C *3/00, 9/00*; H03K *1/17*

U.S. Cl. 368—200 **2 Claims**



1. An electronic timepiece comprising:

means for producing time base pulses;

a frequency divider connected to receive said time base pulses;

a pulse rate correction circuit connected between said time base pulses producing means and said frequency divider for modifying the number of pulses received by the frequency divider during a predetermined period of time by a predetermined number of correction pulses;

a driver circuit connected to receive the output signal provided by said frequency divider; and

a time display device controlled by said driving circuit, characterized in that said pulse rate correction circuit is arranged to divide said period of time into a given number of sub-periods and to distribute said correction pulses substantially equally over said sub-periods.

4,408,898

POSITIONING MECHANISM FOR A CENTER WHEEL

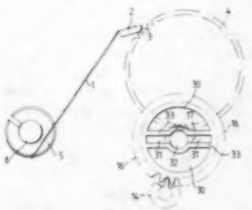
Cyril Vuilleumier, and Bruno Erni, both of Bienne, Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Nov. 12, 1980, Ser. No. 206,228

Claims priority, application France, Nov. 16, 1979, 79 28761

Int. Cl.³ G04B *19/02*

U.S. Cl. 368—220 **6 Claims**



1. Positioning mechanism for a centre wheel which is moved in steps in an electronic timepiece with analog display having an indicator attached to said centre wheel, said timepiece being of a type including a stepping motor and a jumper spring of which a first end is provided with two inclined planes adapted to cooperate with teeth of the centre wheel and the second end is rotatably mounted with friction fit into the base plate, said positioning mechanism comprising: a gear train coupled between the stepping motor and the centre wheel through which the motor drives the centre wheel in steps, said gear train comprising at least a pinion, a gear and a friction mounting means for mounting said pinion to said gear by friction which is sufficiently high so that in normal operation of the timepiece

transmission of motion is made without slippage between the pinion and the gear to drive the indicator, however low enough so that it is possible to manually cause slippage of the pinion relative to the gear; means for manually causing said slippage to adjust the position of the centre wheel relative to step positions of the motor to bring the two inclined planes of the jumper spring into proper coincidence with a tooth space on said centre wheel at each tooth position for precisely positioning the indicator relative to markings of the dial of the timepiece between steps.

4,408,899

ELECTRONIC CLOCK STRIKING MECHANISM

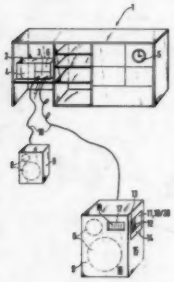
Hans Flaig, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 285,799

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033087

Int. Cl.³ G04B *21/00*

U.S. Cl. 368—273 **5 Claims**



1. In an electronic clock striking mechanism having a control circuit including a detector for detecting a real-time related signal and a signal transducer circuit which is actuated to produce an acoustic time indication in response to detection of a predetermined time signal, the improvement wherein said control circuit is built into a loudspeaker housing for a conventional diverse element commonly found in a dwelling and is operatively connected to a speaker in said housing to emit the acoustic time indication through said speaker upon actuation of said signal transducer circuit, and further including a sensor circuit for sensing a signal from said diverse element and for selectively disconnecting said signal transducer circuit from said speaker when a signal is sensed.

4,408,900

JOINT STRUCTURE OF BEZEL AND WATCH BODY

Tsuneji Takasugi, and Seiji Umezawa, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,110

Claims priority, application Japan, Apr. 24, 1980, 55-56166[U]

Int. Cl.³ B23K *9/12, 9/16*

U.S. Cl. 368—295 **10 Claims**

1. A joint structure of a watch body and a bezel comprising:

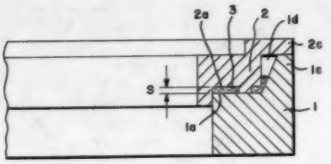
a watch body having a joint surface;

a bezel having a joint surface;

at least one projection extending from one of said joint surfaces, said projection being welded onto the other joint surface;

a space between said joint surface; and

connecting material filling said space provided in the proximity of said projection, wherein said connecting material



is melted by the heat and fills said space when said projection is welded.

4,408,901

MINIATURE PUSHBUTTON

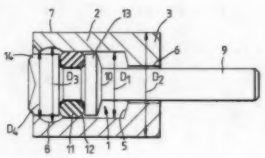
Gaston Gagnebin, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

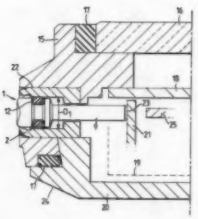
Filed Dec. 8, 1980, Ser. No. 214,156

Claims priority, application France, Dec. 13, 1979, 79 31025

Int. Cl.³ G04B *29/00*

U.S. Cl. 368—321 **5 Claims**





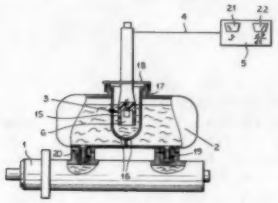
1. A miniature pushbutton for an electronic timepiece comprising a socket forming means defining a socket having its innermost extremity terminating in a base portion provided with an opening and a head-stem member integrally formed by a first portion adapted to pass through said opening and a second portion adapted to slide freely in the socket, said second portion including a groove arranged to retain a sealing means and a sealing means mounted in said groove for cooperating with the interior wall of the socket to allow relatively easy movement of said second portion in said socket, said pushbutton being of a dormant corrector type, the return movement thereof being assured by means entirely external thereto, the diameter of said first portion being constant and said socket forming means including a retaining means proximate the outermost extremity of the socket for cooperating with said sealing means to prevent said relatively easy movement of said second portion in said socket and thereby preventing inadvertent separation of said head-stem member from said socket.

4,408,902

METHOD OF AND DEVICE FOR DETERMINING THE BOILING POINT OF A LIQUID

Karl Peuker, Ebern, Fed. Rep. of Germany, assignor to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,104
Claims priority, application European Pat. Off., Jan. 17, 1981, 81100334.2
Int. Cl.³ G01N *25/08*
U.S. Cl. 374—27 9 Claims



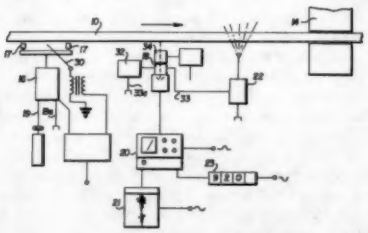
1. A method of determining the boiling point of a liquid, comprising the steps of:
(a) confining a quantity of the liquid to be tested in a space closed at the top and in communication at the bottom with a larger body of the same liquid;
(b) gradually heating the liquid in said space;
(c) continuously measuring the temperature in said space during the heating step; and
(d) registering the occurrence of a significant change in the rate of temperature rise measured in step (c) as an indication of the boiling point of the liquid having been reached.

4,408,903

METHOD OF AND APPARATUS FOR RADIATION PYROMETRIC TEMPERATURE MEASUREMENT OF A CONTINUOUS CAST METAL BAR

Giuseppe Baldasarri, Carrollton, Ga., assignor to Southwire Company, Ga.

Filed Mar. 30, 1981, Ser. No. 248,155
Int. Cl.³ G01J *5/02*
U.S. Cl. 374—121 26 Claims



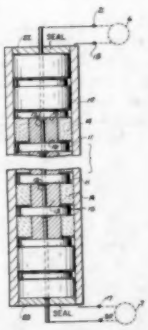
1. In a method for continuous casting and rolling of a metal bar into rod including the steps of casting molten metal into a metal bar in a casting machine, conveying the cast metal bar to a rolling mill and rolling said cast bar into a rod the improvement comprising, continuously measuring the temperature of said cast bar as said cast bar moves between said casting machine and said rolling mill said continuous temperature measurement comprising the steps of:
(a) providing a constant flow of acetylene from an acetylene source;
(b) flowing said acetylene through an acetylene filter;
(c) passing said filtered acetylene through an acetylene solenoid value adapted to receive remote signals capable of interrupting or starting flow of acetylene;
(d) flowing said acetylene through an acetylene flow control valve adapted to adjust acetylene flow to a rate which is independent of the pressure of the acetylene source;
(e) passing said acetylene through an acetylene flow meter;
(f) providing a constant flow of air;
(g) flowing said air through an air filter;
(h) passing said filtered air through an air solenoid valve adapted to receive remote signals capable of interrupting or starting flow of air;
(i) flowing said air through an air flow control valve adapted to adjust air flow to a rate which is independent of pressure up stream of said control valve;
(j) passing said air through an air flow meter;
(k) mixing said acetylene and said air into an acetylene air mixture;
(l) flowing said mixture through a manifold to sooting tips adjacent to the path of said cast bar;
(m) igniting and burning said mixture in a controlled manner whereby a uniform layer of soot is deposited on the surface of said cast bar to form an area of controlled emissivity;
(n) continuously detecting infrared radiation emitted from said area of controlled emissivity;
(o) continuously converting said detected radiation into an electrical signal representative of the temperature of said cast bar; and
(p) continuously removing said soot from the surface of said cast bar before said cast bar enters said rolling mill.

4,408,904

TEMPERATURE PROFILE DETECTOR

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Dec. 3, 1980, Ser. No. 212,310
Int. Cl.³ G01K *11/00, 13/00*
U.S. Cl. 374—137 8 Claims



1. A temperature profile detector, comprising:
a first elongated electrical conductor means;
a second elongated electrical conductor means spaced from and parallel to the first conductor means, the length of said second
conductor means overlapping at least a portion of the length of said first conductor means;
a plurality of meltable segments spaced apart from one another along the length of one of said conductor means and in electrical contact with said conductor means in positions physically separated from the remaining conductor means, each segment being fabricated from electrically conductive material having a preselected melting point below those of said both conductor means;
and electrical insulator means comprising a plurality of

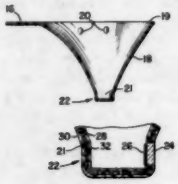
ceramic elements stacked along said both conductor means in bridging contact between said both conductor means at spaced locations along their lengths, each element including at least one defined channel for confining molten metal from an associated segment in such bridging contact.

4,408,905

URINARY TEMPERATURE MEASUREMENT DEVICE

Joel R. L. Ehrenkranz, 12 Crest Cir., South Orange, N.J. 07079

Filed Jun. 11, 1981, Ser. No. 272,689
Int. Cl.[3] G01K 11/12
U.S. Cl. 374—157 7 Claims



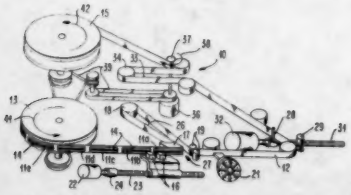
1. A device for measuring core body temperature in humans comprising: a funnel shaped receptacle having a mouth and an exit port adapted to receive urine voided directly thereinto; a chamber integrally attached to said receptacle at the exit port thereof for receiving at least a portion of the urine voided thereinto; said chamber having a base and upstanding walls and a transparent window mounted in at least a portion of said upstanding walls; liquid crystal temperature measurement means mounted within said chamber and affixed to said window for registering the temperature of urine voided into said receptacle and said chamber and for displaying said temperature registration through said window for external view.

4,408,906

HIGH SPEED ON-DEMAND PROCESSOR FOR PRESSURE SENSITIVE LABELS

Leonard J. Wallace, Charlotte, N.C., assignor to International Business Machines, Armonk, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,833
Int. Cl.[3] B41J 3/516
U.S. Cl. 400—104 18 Claims



1. On-demand apparatus for processing a plurality of closely spaced labels releasably mounted on a carrier strip which extends between first and second processing stations, comprising:

means for processing one of said plurality of labels before processing labels adjacent said one of said plurality of labels; said means for processing one of said plurality of labels further comprising:

means forming a loop of said carrier strip between said first and second processing stations, said loop having a gap at one end thereof;

means for moving said first processing station over said one of said plurality of labels to process said one of said plurality of labels;

means for transferring a processed label across said gap; and

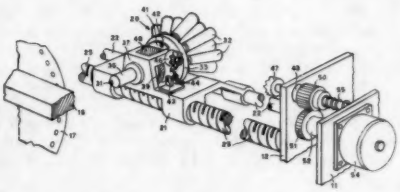
means for moving a transferred label through said second processing station independent of movement of said carrier strip at said first processing station by shortening said loop.

4,408,907

DOT PRINTING DEVICE FOR ACCOUNTING, TERMINAL, TELEWRITING MACHINE, AND SIMILAR OFFICE MACHINE

Francesco Bernardis, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 21, 1980, Ser. No. 199,189
Int. Cl.[3] B41J 3/12
U.S. Cl. 400—124 5 Claims



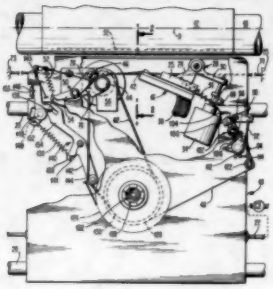
1. A dot printing device for printing characters and graphic symbols on a recording medium according to dot matrices which each have a predetermined standard height (h) said device comprising a print head having longitudinally movable printing wires, a plurality of electromagnets associated with said printing wires, an electronic circuit for the energization of said electromagnets and the actuation of the associated wires to impact said recording medium for printing thereon, and a guide member for guiding said printing wires adjacent to said recording medium and positioning them in an array, wherein the height (l) of said array of wires is at least twice said standard height (h), means for moving said print head parallel to said recording medium along a rectilinear path, means for varying the inclination of said guide member from a first angular position wherein said array of wires is substantially perpendicular to said rectilinear path to a second angular position wherein said single array is slanted with respect to said rectilinear path, and means associated with one or the other position of said guide member in order to control the actuation of said printing wires for simultaneously printing two lines of characters and graphic symbols with low definition dot matrices and high printing speed when said guide member is in said first angular position and for printing only one line of characters and graphic symbols with a high definition dot matrix having said standard height when said guide member is in said second angular position, said electronic circuit comprising a central unit connected to an input device and to at least two line memories, the data to be printed supplied by said input device being memorized in alternate lines on said two memories and taken from said central unit in parallel manner when said guide member is in said first angular position, and being memorized one line at a time on one of said memories and taken in serial manner by said central unit when said guide member is in said second angular position.

4,408,908

RIBBON FEED SYSTEM FOR A MATRIX PRINTER

Steven L. Applegate, and James J. Molloy, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1980, Ser. No. 218,228
Int. Cl.[3] B41J *3/04*
U.S. Cl. 400—120 12 Claims



1. For use in a printer of the kind that employs a multi-electrode printhead mounted on a carrier for engaging a printing ribbon in sweeping print motions along a print line to inject printing currents that are selectively supplied from a set of electrode drivers for causing marking of a receiving medium for graphic printing operation characterized by a forward direction of motion along the print line, a ribbon feed arrangement comprising:

supply means for supplying a printing ribbon,

takeup means for taking said ribbon from said supply means,

path means for defining a ribbon path between said supply means and said takeup means that extends said ribbon around said printhead;

metering means for feeding said ribbon, said metering means including a pair of cooperating rollers mounted on said carrier and separate from said takeup means, located on the takeup side of said printhead, that nip said ribbon and drive means for coupling motion corresponding to carrier movement relative to said receiving medium to at least one of said rollers;

coupling control means for selectively enabling and disabling said metering means; and

means for connecting one of said rollers to provide a return path for printing currents that extend from said ribbon to said electrode drivers.

4,408,909

PRINTER WITH CARTRIDGE TYPE WHEEL

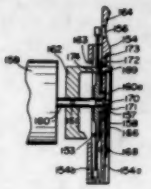
Kiyomitsu Asano, Musashino, and Tetsuo Watanabe, Tokyo, both of Japan, assignors to Ricoh Co., Ltd. and Nihon Tsushin Gijyutsu Kabushiki Kaisha, both of, Japan

Division of Ser. No. 76,389, Sep. 17, 1979, Pat. No. 4,310,255.
This application Sep. 3, 1981, Ser. No. 299,079
Claims priority, application Japan, Sep. 18, 1978, 53/113585
Int. Cl.[3] B41J *1/60, 1/27*
U.S. Cl. 400—144.2 14 Claims

1. A type wheel cartridge for a printer having a type selection motor with motor shaft and a type wheel mounted on the shaft for rotation of the type wheel when the cartridge is engaged with the printer, the type wheel having a center disk with a center opening for receiving the motor shaft and a plurality of fingers extending radially from the center disc comprising:

a box-shaped cartridge defining a space for receiving the type wheel; and

a resilient holding arm connected to the cartridge and having a projection extending into the center opening of the type wheel for centering the type wheel with the motor shaft disengaged from the type wheel, said projection being pushed out of the center opening by an introduction of the motor shaft into the center opening of the type wheel;



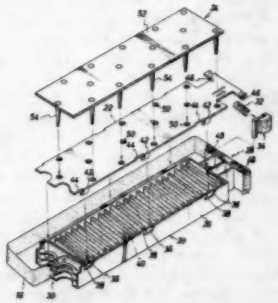
the holding arm including a holding claw, the cartridge including an opening for receiving the holding claw, the type wheel formed with another opening for receiving the holding claw when the holding claw is positioned through the cartridge opening.

4,408,910

INK RIBBON PROTECTING MECHANISM IN INK RIBBON CARTRIDGE

Sasaki Masao, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,258
Claims priority, application Japan, Nov. 25, 1980, 55-167411[U]
Int. Cl.[3] B41J *33/14*
U.S. Cl. 400—207 4 Claims



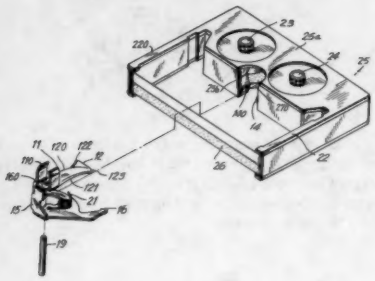
1. In an ink ribbon cartridge for a printer for containing therein an endless ink ribbon and successively feeding the ink ribbon for a printing operation by a feeding mechanism of the printer, a case member including wall members and having in the interior thereof an ink ribbon-storing portion having a depth substantially equal to the width of the ink ribbon and also having an inlet and an outlet for the ink ribbon and a plate-like lid member integrally associated with said case member; an ink ribbon protecting mechanism comprising through holes formed on said cartridge and an auxiliary member comprising a substrate and projections formed on the substrate, said projections corresponding to the interval and shape of said through holes, the projections of the auxiliary member being inserted in said through holes to intrude among laps of the ink ribbon in its folded state contained in the ink ribbon cartridge to thereby prevent falling or twisting of the ink ribbon during transportation.

4,408,911

INK RIBBON WINDING AND REVERSING ASSEMBLY

Tadayoshi Shimodaira, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan

Filed May 15, 1978, Ser. No. 905,915
Claims priority, application Japan, May 13, 1977, 52-55104
Int. Cl.³ B41J *35/28, 33/50*
U.S. Cl. 400—208 **26 Claims**



1. An ink ribbon winding and reversing assembly comprising:

a first and a second rotatably mounted ratchet wheel spaced apart from each other;

winding means for selectively operatively engaging one of said ratchet wheels to become the first winding ratchet wheel to drive said ratchet wheel in a first winding direction;

detecting means operatively engaged with the second ratchet wheel for selectively detecting completion of unwinding from said second ratchet wheel; and

reversing means for reversing winding direction by operatively engaging said winding means with said second ratchet wheel to become the winding ratchet wheel to drive said second ratchet wheel in a second winding direction;

said detecting means operatively coupled to said winding means for reversing engagement of said winding means from said first ratchet wheel to said second ratchet wheel and for reversing engagement of said detecting means from said second ratchet wheel to said first ratchet wheel upon detecting completion of winding; and said detecting means including projecting means for aligning said detecting means when an ink ribbon cassette having two ink ribbon spools rotatably mounted therein is being mounted on said assembly, said projecting means extending into the interior of said cassette in the region between said spools, said cassette including cooperating guide surfaces in the region between said spools for engaging said projecting means, whereby said detecting means is displaced to a neutral position substantially at the midpoint of the spools.

4,408,912

RIBBON CARTRIDGE WITH SHIELD

Edward Yonkers, Newton, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 78,653, Sep. 24, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,904
Int. Cl.³ B41J *33/10*
U.S. Cl. 400—208 **6 Claims**

1. A ribbon cartridge for high speed printers having a printhead and paper to be printed thereon, comprising:

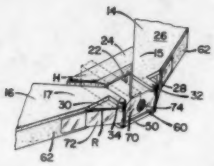
a main ribbon storage compartment and a pair of arms extending generally in the same direction from the compartment,

a ribbon stored in the compartment and extending from one arm and entering the other of the arms,

a gap between the arms defining an exposed ribbon path essentially parallel to the print plane of the printer and between the plane of the paper on which the printing is to occur and the printhead,

a bridge joining the arms below the lower edge of the ribbon in the gap,

a shield mounted in part by the bridge and lying on the side of the ribbon facing the paper, said shield preventing the paper from engaging and displacing the ribbon from the



ribbon path, and having a substantially flat central panel extending across the gap,

a window in the shield through which the printhead may engage the ribbon to make an impression on the paper,

said shield further having oppositely directed end wings extending from said flat central panel in a direction out of the plane of the central panel and extending rearwardly,

said pair of arms each having a front surface extending from the gap,

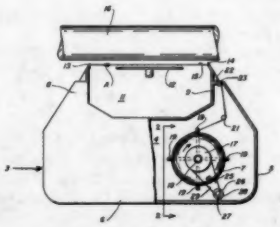
and means adhesively securing each wing to the compartment arm front surfaces.

4,408,913

INKED RIBBON CARTRIDGE RIBBON WITH SUPPLY SPOOL DRAG DEVICE

Thomas E. Frechette, Windsor Locks, Conn., assignor to Royal Business Machines, Inc., Windsor, Conn.

Filed Feb. 22, 1982, Ser. No. 350,818
Int. Cl.³ B41J *35/28*
U.S. Cl. 400—208 **4 Claims**



1. An inked ribbon cartridge rotatably supporting supply and take-up spools adapted to be mounted on a typewriter or like machine, said cartridge having exit and entry apertures to permit ribbon to be incrementally drawn off said supply spool onto said take-up spool incident to print actions with a length of ribbon between exit and entry apertures exposed to a printing element,

said supply spool having a core on which ribbon is wound, said supply spool being rotatable about a post,

said core having an axial length greater than the width of the ribbon wound thereon whereby a terminal portion of its length extends beyond said wound ribbon,

a circumferential groove in said terminal core portion,

a fixed drag post in said cartridge extending parallel to the

axis of said supply spool core and spaced therefrom a distance exceeding the radius of a fully wound supply spool,

said drag post being fixed against both translational and rotational movement relative to said post,

and a stretched O-ring of resilient material mounted in said groove and trained about said drag post.

4,408,914

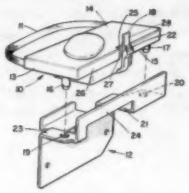
PRINTER RIBBON CARTRIDGE MOUNTING ASSEMBLY

Allen R. Ciesiel, Arlington Heights; Richard E. LaSpesa, and Ruperto B. Zolavvar, both of Chicago, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Sep. 29, 1982, Ser. No. 427,211

Int. Cl.³ B41J *32/00, 35/28*

U.S. Cl. 400—208 **9 Claims**



1. A printer ribbon cartridge mounting assembly comprising:

a printer ribbon cartridge housing arranged to house a printer ribbon;

a pair of guide pins projecting from the bottom surface of the housing;

a resilient cantilevered tab projecting from the bottom surface of the housing and extending substantially parallel to a side of the housing and past the top surface of the housing;

a mounting bracket having a pair of openings arranged to accommodate the guide pins and further having an aperture arranged to accommodate a portion of the resilient tab; and

an uneven surface located on the resilient tab, a portion of the uneven surface arranged to enter the aperture and engage the bracket when the guide pins are inserted into their respective openings thereby locking the housing to the bracket.

4,408,915

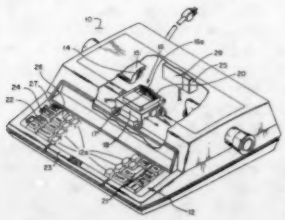
REVERSE TAB CONTROL SYSTEM FOR TYPEWRITERS

Michael H. Smith, New Milford, Conn., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,747

Int. Cl.³ B41J *25/18*

U.S. Cl. 400—290 **7 Claims**



1. A tab control system for a typewriter comprising a keyboard containing character keys; type elements and a carrier therefor; mechanical striking means attached to said carrier and capable of striking said type elements against a platen in accordance with characters selected on said keyboard; said carrier, said mechanical striking means, and said type elements being arranged to move axially with respect to said platen, said carrier also being arranged to move a predetermined distance in a predetermined direction with the striking of any character of said type element means against said platen, said keyboard having:

(a) tab set means for manually presetting a plurality of tab stop positions of said carrier with respect to said platen,

(b) tab clear means for manually clearing any of said plurality of said tab stop positions, when set,

(c) tab actuating means responsive to a first kind of manual actuation thereof for moving said carrier to any of said plurality of preset tab stop positions,

said system including tab control means for moving said carrier from its present position to the closest preset tab stop position in said predetermined direction upon each manual actuation of said tab actuating means, said tab control means also being arranged to move said carrier to the closest predetermined tab position in a direction opposite to said predetermined direction and for rotating said platen through a predetermined angle so as to cause any type-receiving medium positioned around said platen to move to a lower line position with respect to said carrier, upon a second kind of manual actuation of said tab actuating means, and for moving said carrier to the closest predetermined tab position in said opposite direction and without rotating said platen, upon each manual actuation of said tab actuating means directly after said second kind of manual actuation thereof.

4,408,916

FEED-IN DEVICE FOR CONTINUOUS FORMS FOR A PRINTER

Manfred Burgert, Obere Breitensteinstrasse 16, 8201 Kolbermoor, Fed. Rep. of Germany

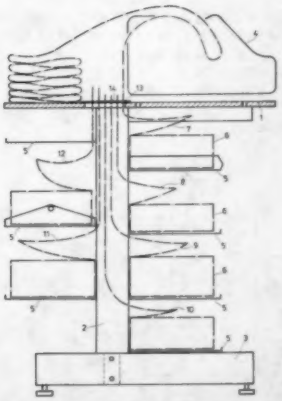
PCT No. PCT/DE80/00135, § 371 Date May 13, 1981, § 102(e) Date May 13, 1981, PCT Pub. No. WO81/00830, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 18, 1980, Ser. No. 269,035

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1979, 2937687

Int. Cl.³ B41J *15/04, 15/18*

U.S. Cl. 400—613.2 **5 Claims**



1. Apparatus for the feed of continuously connected form strips to a printing device, comprising means for guiding said strips to said printing device, means for positioning said strips below the guiding means, and means included in said guiding means for individually retaining a plurality of said strips ex-

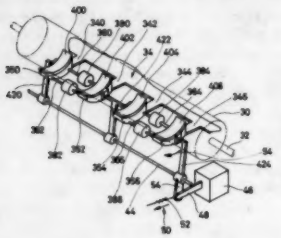
tending vertically through and terminating above said guiding means, said strips being from separate sources, and held in position for being grasped individually by a user for subsequent feed to said printing device.

4,408,917

PAPER GUIDE MECHANISM IN A PRINTER

Hiroji Iwai, Yamatokoriyama, and Hirotoshi Matsui, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 5, 1982, Ser. No. 346,188
Claims priority, application Japan, Feb. 9, 1981, 56-17496[U]
Int. Cl.³ B41J *13/048*
U.S. Cl. 400—637.2 **4 Claims**



1. A paper guide mechanism for guiding a paper sheet around the surface of a platen in a printer, comprising:

at least one paper feed roller disposed below said platen, the axis of said paper feed roller being fixed with respect to the axis of said platen;

at least one guide plate disposed below said platen juxtapositioned to said at least one feed roller, said guide plate being slidably superimposed on a corresponding stationary guide member, the face of said guide plate being shaped to accommodate the surface of said platen while maintaining a predetermined distance therebetween; and

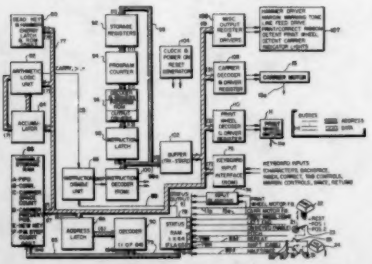
shift means for shifting said slidable guide plate relative to said stationary guide member and along the surface of said platen toward the front portion of said platen.

4,408,918

HALFSPACE CONTROL SYSTEM FOR ELECTRONIC TYPEWRITER WITH CORRECTION REGISTER

Michael H. Smith, New Milford, Conn., assignor to SCM Corporation, New York, N.Y.

Filed May 1, 1981, Ser. No. 259,722
Int. Cl.³ B41J *29/16*
U.S. Cl. 400—697.1 **6 Claims**



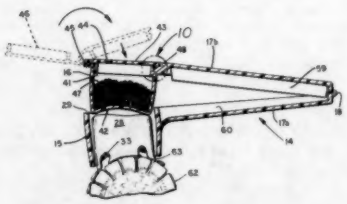
1. A halfspace control system for a typewriter comprising a keyboard containing character keys; an electronic system responsive to electrical outputs from said keyboard for generating control signals; mechanical striking means capable of striking any of the characters from said keyboard against a platen and moving across said platen, said mechanical striking means being responsive to said control signals for striking selected characters, corresponding to those selected upon operation of said keyboard, against said platen and moving a predetermined distance in a predetermined direction across said platen upon the striking of each character against said platen; storage means within said electronic system for storing and continuously updating its storage of the last plurality of characters struck against said platen; backspace and correction means within said electronic system for selectively causing said striking means to move in discrete steps, each step being of said predetermined distance, in a direction opposite to said predetermined direction and for selectively restriking the characters stored in said storage means in registration with the respective positions previously struck against said platen; a halfspace manually controllable input means within said typewriter; and halfspace control means within said electronic system responsive to a first operation of said halfspace input means for (A) causing said mechanical striking means to move across said platen by one-half said predetermined distance and (B) erasing the contents of said storage means in conjunction with execution of said half-distance motion of said striking means across said platen.

4,408,919

CORN BUTTERING AND SALTING APPARATUS

Martin J. Wolff, North Providence, and Joseph S. Falvo, Johnston, both of R.I., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Oct. 9, 1981, Ser. No. 310,297
Int. Cl.³ A47G *21/06*
U.S. Cl. 401—12 **11 Claims**



1. Apparatus for applying butter and salt to an article such as an ear of corn or the like, comprising:

first means defining a butter receptacle having a butter receiving opening for receiving a quantity of butter or the like, and having a butter dispensing opening for dispensing the butter onto the article;

second means defining a salt receptacle for receiving a quantity of salt or the like;

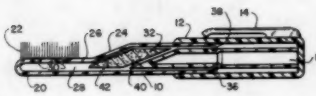
means movably interconnecting said first means and second means and selectably movable either to a first position permitting butter to be inserted in said butter receiving opening, or to a second position entering said butter receiving opening to urge the butter toward said dispensing opening, so that said salt receptacle is operable to dispense butter from said butter receptacle; and

a salt dispensing opening on said salt receptacle unobstructed by said butter receptacle while said salt receptacle remains in said butter receptacle.

4,408,920
POCKET TOOTHBRUSH

Mike C. Walther, and Manuel A. Mena-Reyes, both of Bronx, N.Y., assignors to Ready Brush, Inc., New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 269,246
Int. Cl.[3] A46B *11/04, 17/04*
U.S. Cl. 401—176 6 Claims

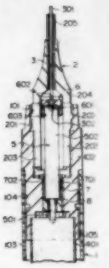


1. A pocket toothbrush having an exterior structure resembling a traditional fountain pen case including a removable cylindrical end cap cover, a main cylindrical body shaft over at least one end of which said end cap cover fits and having exterior protruding means engagable with the interior of said end cap cover to retain said end cap cover, said cylindrical body shaft having a cross section at one end which is reduced to substantially a minor segment of a circle, said reduced section end having toothbrush bristles extending transversely and confined within the circular profile of the transverse section of the remainder of the main cylindrical body shaft, said cylindrical end cap cover being adapted to cover said reduced section end and said bristles when placed over said reduced section end and engaged with said protruding means on said body shaft, said end cap cover being adapted to be attached to the end of said body shaft opposite to said reduced section end by telescoping over said opposite end of said body shaft, said cylindrical body shaft including an interior passage extending into said reduced section end and having at least one termination opening in the area at the base of said toothbrush bristles, means for feeding toothpaste through said passage and through said opening into said bristles at the time of use, said interior passage in said cylindrical body shaft being widened out to a full cylindrical bore at the end opposite said reduced section end, said means for feeding the toothpaste through said passage comprising a movable plunger extending into said cylindrical bore in said main cylindrical body shaft, said full cylindrical bore including an interior space for the accommodation of a charge of toothpaste to be fed to said bristles by the operation of said movable plunger, said interior space for the charge of toothpaste being defined by the inner end of said full cylindrical bore and by the inner end of said plunger as essentially a cylinder with substantially parallel axially oppositely aligned faces which are tilted substantially away from a plane normal to the cylinder axis to provide substantially slanted opposing cylinder faces, one of said faces being defined by the interior end of said plunger, and the other one of said cylinder faces being defined by the inner end of said full cylindrical bore in the transition of said interior passage to the portion connected to said termination opening at the base of said toothbrush bristles, said toothbrush bristles being of graded lengths when viewed in an end profile and with the longest bristles being positioned at the center and successfully shorter bristles positioned towards the sides so that the tips of said bristles form a semi-circular end profile to fit within said cylindrical end cap cover.

4,408,921
DETACHABLE HEAD MEMBER HAVING SLIT STRUCTURE

Masahiko Nagai, Tokyo, Japan, assignor to Ogawa Chemical Industries, Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,316
Claims priority, application Japan, Nov. 13, 1980, 55-163186[U]
Int. Cl.[3] B43K *3/00, 8/02*
U.S. Cl. 401—198 2 Claims



1. A marking pen including a head seat member extending from the top portion of a shaft tube and threadedly engaged therewith in an axially movable manner, and a tip member extending through said head seat member and removably mounted thereto, permitting the length of the top portion of said tip member projecting from said head seat member to be adjusted which comprises:

a projecting structure adapted to come in contact with the top portion of the inner surface of said shaft tube, said structure being provided in the outer circumferential surface of the engaging tube of said head seat member,

at least one axially elongated slit means provided in the said engaging tube of said head seat member and extending substantially to the end thereof, said engaging tube being engaged with said shaft tube and being deformable because of said slit means,

an ink guide core fixed within said shaft tube and communicating with an ink reservoir member disposed in said shaft tube, the top portion of said ink guide core being provided with a small-diameter central opening which is adaptable to the diameter of said tip member, said opening having a conical, inclined surface, and

a collector having an aperture adapted to accommodate the diameter of said ink guide core at the base part side of said central opening opposite said conical surface, said collector being positioned over and fixed to the top portion of said ink guide core, the base portion of said tip member projecting from said head seat member extending through said collector for connection with said ink guide core.

4,408,922
COUPLER

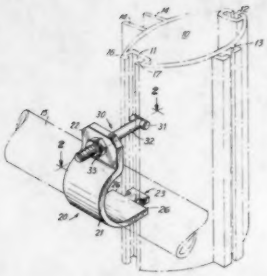
Michael S. D'Alessio, Flushing, N.Y., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Feb. 6, 1981, Ser. No. 232,318
Int. Cl.[3] F16B *2/02*
U.S. Cl. 403—12 31 Claims

30. In combination, a shoring or scaffolding stanchion having a vertical T-slot extending therealong adapted to receive the head end and a portion of the shank of a bolt, and a coupler, the coupler comprising

collar means extending part way around the circumference of tubing to engage said length of tubing and to hold the same against said stanchion, said collar means having first and second ends;

engaging means formed at said first end of said collar means adapted to be insertable into said vertical T-slot to hold said first end of the collar means provisionally by achieving a provisional purchase against the stanchion and preventing the coupler from sliding in the T-slot, and to securely hold said first end in said T-slot after said collar means engages said tubing;



securing means at the second end of said collar means permitting engagement of said second end with said T-slot for securing said collar means and said length of tubing firmly in place against said stanchion; and

means for preventing said engaging means from disengaging from said provisional purchase while said securing means is being engaged with said T-slot.

4,408,923

FITTING FOR CONNECTING TWO VERTICALLY ABUTTING BODIES OF FURNITURE

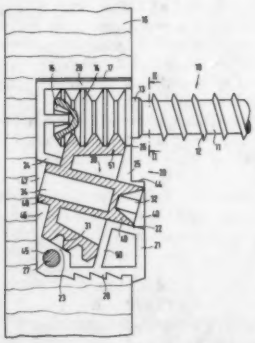
Eberhard Kubler, Frommern, Fed. Rep. of Germany, assignor to Hafele KG, Nagold, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,928

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 8006733[U]

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—20 **12 Claims**



1. Connection fitting for disconnectible joining two vertically abutting pieces of furniture in their region of contact, in which one furniture piece is provided with a projecting fastener bolt having a fastening head thereon, and the other furniture piece is provided with a cup-shaped casing in a cavity, said casing enclosing rotatably mounted tensioning means, and in which the head of the fastener bolt is in operative connection with the tensioning means and is adapted to be pulled into the casing by the rotational movement of the tensioning means, characterized in that the fastening head of the fastener bolt **(10)** is provided with external ribs **(14)** the individual ribs being circumferential and perpendicularly directed to the longitudinal axis of the fastener bolt **(10)**, the tensioning means being constructed in the form of a worm **(30)** the screw thread **(31)** of which are adapted to mesh with said external ribs **(14)** of the fastening bolt **(10)**, and that the fastener bolt **(10)** is adapted to be inserted from the front side of the casing **(20)**, and the worm **(30)** is rotatable from said front side.

4,408,924

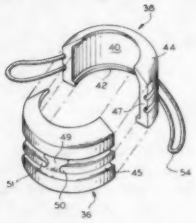
SPLIT COLLAR

Richard Huebner, New Berlin, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Aug. 25, 1982, Ser. No. 411,547

Int. Cl.³ F16B *2/08*

U.S. Cl. 403—23 **12 Claims**



1. A collar for surrounding an article comprising:

first and second collar sections having abutting edges, internal surfaces and external surfaces, the internal surfaces of said collar sections being adapted to surround said article when said abutting edges are adjacent one another and said internal surfaces defining an opening through said collar to accommodate said article;

groove means formed in said external surfaces of said collar sections and lying in a plane which is perpendicular to said opening, said groove means comprising a pair of parallel and spaced apart grooves extending about said external surfaces,

coupling means on one of said first or second collar sections;

elastic means coupled to said coupling means and surrounding said first and second collar sections in said groove means and holding said collar sections together about said article.

4,408,925

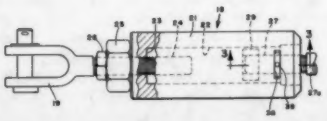
CABLE TENSION METER

Edmund A. Louie, San Jose, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 22, 1981, Ser. No. 276,238

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—27 **2 Claims**



1. In a turnbuckle assembly having a sleeve, a first coupler threadedly connected to one end of said sleeve, a second coupler spaced from said first coupler and connected to the other end of said sleeve, said couplers being adapted to be connected to externally anchored tension members, said sleeve being rotatable relative to said couplers for shortening the distance therebetween and subjecting the members to a tension force,

the improvement of means for indicating the application to said members of a tension force of predetermined value comprising:

first abutment means on the inner end of the second coupler,

second abutment means on said sleeve at said other end thereof,

spring means comprising a plurality of concave-convex washers between and in engagement with said first and second abutment means adapted to be compressed with a force proportional to the tension force on said members upon rotation of said sleeve relative to said members,

means responsive to compression of said spring means upon rotation of said sleeve relative to said members for indicating attainment of the tension force of predetermined value on said members,

one of said washers having a convex surface proximate to said second abutment means, a plane washer being disposed between said convex surface and said second abutment means, said plane washer being spaced from said convex surface when the compression force in said spring means is less than the predetermined value and engaging said convex surface when said compression force is equal to the predetermined value, and

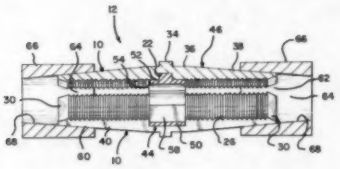
means connected to said plane washer for indicating contact of said surface with said plane washer whereby to indicate a pre-load tension force of said predetermined value on said members.

4,408,926

AXIAL CRIMP CONNECTION DEVICE

Walter M. Werner, Downingtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 26, 1981, Ser. No. 267,212
Int. Cl.³ F16B *2/02*
U.S. Cl. 403—310 **2 Claims**



1. A device for connecting two cylindrical objects together, said device comprising:

a. a jaw assembly of three elongated jaw segments, each segment having a first, U-shaped surface and generally opposite thereto a second surface which is curved from one side to the other and is beveled towards the first surface from adjacent the midpoint out to each end, said segments being joined together to form a jaw assembly having an interior passage adapted to receive cylindrical objects from each end and an outer, cylindrical surface which is tapered from adjacent the midpoint to the ends;

b. a spacer of compressible material having three sides with flanges extending outwardly from the corners thereof, said spacer being positioned in the assembly with each flange between adjacent segments for holding the segments together in spaced apart fashion; and

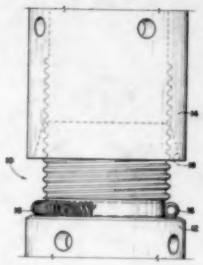
c. a pair of collars, each having a tapered passage therethrough, said collars being slidably mounted on each end of the jaw assembly with the wider end of the passage being placed on the assembly first so that upon driving the collars along the tapered surface of the assembly towards the midpoint, the jaw segments are axially compressed onto cylindrical objects which may be placed in the passage of the assembly.

4,408,927

THREADED JOINT TOGGLE-LOCKED WITH A HELICAL SPRING

Igor Fraiberg, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Aug. 17, 1981, Ser. No. 293,517
Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—320 **6 Claims**



1. A threaded joint comprising:

(a) a pair of threaded members that thread together;

(b) a circumferential confining member that creates an annular cavity as said pair of threaded members are assembled; and

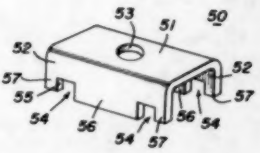
(c) a latching means, that fits within said annular cavity, that requires the application of a torque to disassemble said threaded joint that is in excess of the torque required to assemble said joint.

4,408,928

CONNECTOR HAVING BENDING MEANS

Mark H. Steinke, North Aurora, Ill., assignor to Lyon Metal Products, Incorporated, Aurora, Ill.

Division of Ser. No. 28,977, Apr. 11, 1979, Pat. No. 4,278,361.
This application Mar. 20, 1981, Ser. No. 245,900
Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—405 **3 Claims**



1. A connector for use in connecting a channel member to a support member wherein the channel member has spaced-apart wall portions defining therebetween a slot with each of said wall portions having a flange thereon extending therefrom and with the support member being provided with adjustable fastening means for extending into the slot, said connector comprising a U-shaped body member dimensioned and arranged to be disposed in a connecting position within the channel member transversely across the slot and engageable with the fastening means for interconnection with the support member, said body member including an end wall and two side walls, said end wall having an aperture therein which receives the associated fastening means, said body member having bending means thereon engageable with the flanges when said body member is disposed in its connecting position for bendingly deforming the flanges when said connector and the support member are moved together by the fastening means, thereby firmly to interconnect said connector and the channel member and the

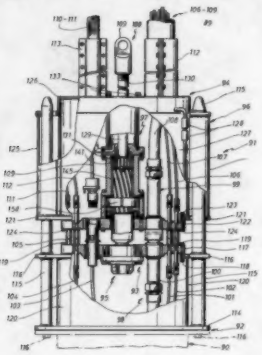
support member in an assembled condition, said bending means comprising two substantially rectangular recesses respectively formed in said side walls and respectively accommodating the flanges therein when said body member is disposed in its connecting position, the width of each of said notches being greater than the width of the projection of each flanges on its associated wall portion.

4,408,929

LATCHING SYSTEM FOR CONTROL LINES FOR PIPE-LAYING BARGES

Hollis A. Baugh, Rte. 1, Box 227, Hempstead, Tex. 77445

Filed Jan. 22, 1982, Ser. No. 341,631
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—166 **21 Claims**



1. A latching system for releasably connecting at least two conduits, comprising:

a base member having at least one upwardly extending conduit and a locking plate supported thereon;

a latching support member including at least one downwardly extending conduit and having a locking mandrel depending therefrom;

means for moving said locking mandrel downwardly through said locking plate; and

means for rotating in a first direction said locking mandrel into locking engagement with said locking plate, whereby the at least two conduits are releasably connected by the engagement of the locking mandrel with the locking plate.

4,408,930

DEVICE FOR DAMPING IMPACTS BETWEEN A LOAD AND A FLOATING SUPPORT WHEN THE LOAD IS REMOVED

Jean-Louis Ninet, and Robert Vaillant, both of Nantes, France, assignors to Societe Anonyme dite Ateliers et Chantiers de Bretagne-ACB, Nantes, France

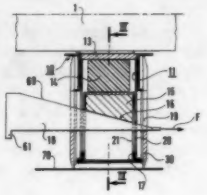
Filed Aug. 24, 1981, Ser. No. 295,453
Claims priority, application France, Dec. 23, 1980, 80 27348
Int. Cl.³ E02B *17/08*
U.S. Cl. 405—209 **2 Claims**

1. A device for damping impacts between a load and an underlying floatingg support at a load bearing point while the load is being removed from said support, said support including at least one housing extending vertically upwardly therefrom on which the load rests and defining a load bearing point, said device comprising:

a damping component mounted within said housing for movement towards and away from said load, and

a wedge operatively engaging said damping component for movement horizontally, and

means for subjecting said wedge to a horizontal traction force to automatically and irreversibly insert said damping component between said load and its bearing point on the floating support as soon as the load is removed from said floating support.

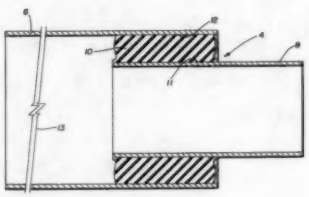


4,408,931

SHOCK CELL PRODUCT

Raymond F. Leblanc, North Canton, and William T. Cummins, Mogadore, both of Ohio, assignors to Teledyne Industries Inc., Los Angeles, Calif.

Filed Apr. 27, 1981, Ser. No. 257,881
Int. Cl.³ E02B *3/20*
U.S. Cl. 405—213 **3 Claims**



1. Energy-absorbing shock cell construction for mounting bumper devices on legs of offshore oil rig structures including an inner small diameter metal pipe member, an outer large diameter metal pipe member, an annular sleevelike vulcanized rubber body located between telescoped end portions of said inner and outer pipe members, an adhesive vulcanized bond between said sleevelike rubber body and one of the pipe members, an adhesive post-vulcanized-bond between said body and the other pipe member, and said sleevelike rubber body being maintained under compression between said vulcanized bonds with said inner and outer pipe members to absorb energy by deflection of the rubber under compression when external force is applied to the outer end of the inner pipe member.

4,408,932

SUBSEA TEMPLATE LEVELLING SYSTEM AND METHOD

William S. Cowan, West University Place, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Dec. 30, 1980, Ser. No. 221,398
Int. Cl.³ E02B *17/08*; E02D *27/52*
U.S. Cl. 405—227 **49 Claims**

1. A template levelling system for levelling a template on a plurality of piles implanted in the floor of a body of water, the combination comprising:

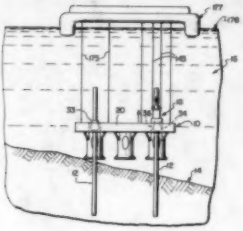
an open ended hub having a pile received therein;

means for pivotally coupling said hub to the template in a passageway in the template;

first gripping means, coupled to said hub, for releasably gripping the pile received in said hub;

a housing;

means for releasably coupling said housing to said hub;
second gripping means, slidably received in said housing, for releasably gripping the pile received in said hub;
means on the exterior of said second gripping means and on the interior of said housing for limiting the slidable movement of said second gripping means relative to said housing; and
means for unlocking and locking said first and second gripping means and for reciprocating said second gripping means relative to said housing to raise and lower the template relative to the pile received in said hub.



4,408,933

CONTACT DETECTING APPARATUS

Tamaki Tomita, Okazaki; Hisaji Nakao, Toyota; Hideo Nishimura, Aichi; Kunihiko Eto, Toyota, and Haruo Ohmura, Aichi, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 10, 1981, Ser. No. 356,818
Claims priority, application Japan, Mar. 10, 1981, 56/34197
Int. Cl.³ B23B *39/04;* G01R *31/02;* G08B *21/00*
U.S. Cl. 408—8 **4 Claims**

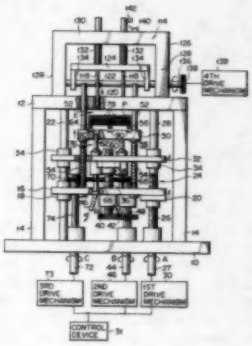
1. In a machine tool including a machine body, a work table mounted on said machine body for mounting thereon a workpiece to be machined, a spindle head mounted on said machine body, a tool spindle rotatably supported in said spindle head for supporting a tool, and control means for effecting relative movement between said work table and said tool spindle, a contact detecting apparatus comprising:
an AC power source;
a magnetic coil mounted on the periphery of said spindle head and connected to said AC power source for generating an induced current in a looped secondary circuit including the workpiece, work table, machine body, spindle head, tool spindle and tool, when said workpiece and said tool are moved relatively into contact with each other, and for generating a potential between the tool and the workpiece when said tool and said workpiece are not in contact;
a first conductive wire forming a secondary winding of one turn in parallel relationship with said looped secondary circuit and having a potential induced across said first conductive wire by energization of said magnetic coil;
a second conductive wire connected at one end thereof to said looped secondary circuit; and
detecting means connected to said first and second conductive wires for detecting contact between said workpiece and said tool based on the difference between the potential across said tool and said workpiece and the potential induced across said first conductive wire.

4,408,934

DRILLING MACHINE

Hiroshi Ohba, and Shigeo Wakamatsu, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 4, 1981, Ser. No. 260,396
Claims priority, application Japan, May 9, 1980, 55-61329
Int. Cl.³ B23B *39/16, 47/26;* B26D *7/02*
U.S. Cl. 408—51 **20 Claims**

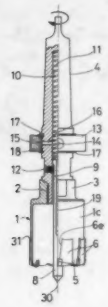


1. A drilling machine for drilling a stack of paper, which comprises:
a fixing frame including a base plate and an upper plate disposed above and substantially parallel to the base plate;
a pressing plate disposed within the fixing frame, substantially parallel to the upper plate and the base plate, movable between the upper plate and base plate along an axis perpendicular to the base plate, paper to be drilled being disposed between the pressing plate and the upper plate;
a first movable member disposed between the pressing plate and base plate, and movable along said axis;
elastic supporting means disposed between the pressing plate and first movable member, for biasing the pressing plate toward the upper plate;
a second movable member movable along said axis;
a drilling mechanism rotatably supported by said second movable member and movable along said axis with said second member for drilling the stack of paper pressed by the pressing plate;
a first driving mechanism for moving said first movable member in a direction to compress the stack of paper and in the other direction to release the stack of paper from said compression;
a second driving mechanism for driving said second movable member to move in a direction to cause said drilling mechanism to drill the stack of paper and another direction to separate said drilling mechanism from the stack of paper; and
a control device for causing said first and second driving mechanisms simultaneously to drive said first and second movable members respectively in said other directions, whereby the stack of drilled paper is released from said compression and said drilling mechanism is separated from the stack of drilled paper.

4,408,935
METAL BORER

Masaaki Miyanaga, Ashiya, Japan, assignor to Kabushiki Kaisha Miyanaga, Hyogo, Japan

Filed Mar. 11, 1981, Ser. No. 242,465
Claims priority, application Japan, Dec. 10, 1980, 55-174956
Int. Cl.³ B23B *41/02*
U.S. Cl. 408—206 **1 Claim**



1. A borer for making an annular cut in a material, said borer comprising a tubular body that is rotatable on its tubular axis and is movable axially forwardly into the material, a plurality of circumferentially spaced blade portions at the forward end of said body, said spaced blade portions forming generally axially extending channels therebetween, said channels being on the outer side of said body and being open at the forward and rearward ends thereof, each of said blade portions forming a sharpened cutting edge at its corner which is forwardmost and advanced in the direction of rotation, a first plurality of said cutting edges being on the radially inner side only of said blade portions and a second plurality of said cutting edges being on the radially outer side only of said blade portions, adjacent cutting edges of said first plurality having cutting edges of said second plurality therebetween whereby said cutting edges of said first and second pluralities alternate around the circumference of said body, the radial width of each cutting edge on said inner side being substantially equal to the radial width of each cutting edge on said outer side, the axial length of each cutting edge on said outer side being greater than the axial length of each cutting edge on said inner side, each cutting edge on said inner side forming a predetermined angle with respect to a radial plane, and at least a portion of each cutting edge on said outer side forming substantially the same angle with the radial plane, the contours of said cutting edges including straight lines connected by angles, and all of said angles being obtuse.

4,408,936
TORQUE-LIMITED THREADED LOCKING FASTENER, AND METHOD FOR SETTING THE SAME

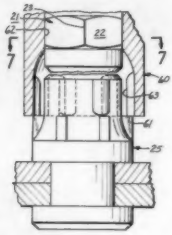
Herman L. Williamson, Seal Beach, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Jan. 15, 1981, Ser. No. 225,356
Int. Cl.³ F16B *39/02*
U.S. Cl. 411—3 **11 Claims**

1. A torque-limited threaded locking fastener comprising:

a shank member having an axis, a head adjacent to one end, and an external thread adjacent to the other end thereof, said thread having a plurality of convolutions, at least one of said convolutions when viewed axially being non-circular;

a collar member comprising a nut section having an axially extending internal thread and at least one integral external rib projecting beyond the outer wall of said nut section and so disposed and arranged as to be axially aligned with the non-circular thread when said nut is fully engaged to said shank member, a drive section having an internal passage aligned with and larger than said internal thread, and a non-circular driver-engaging surface to receive a driver for applying torque to said drive section, and a shear section joining said nut section and drive section, said shear section having the least resistance to torque of said sections whereby to fracture when a predetermined torque is applied to said drive section;



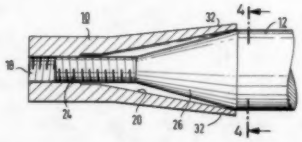
said rib being so proportioned and arranged that when a swaging tool is applied to displace the rib material radially inward thereby to displace material of which the nut section is made into said non-circular thread to lock said nut section to said thread after it does so, but only after, the drive section has torqued off, and without increasing the torque which existed when said shear section fractured;

the material of said rib and of said nut section being sufficiently ductile to enable said rib to be swaged inwardly.

4,408,937
ANCHOR BOLT

Volker Hainke, Lilienthalstrasse 16, 4800 Bielefeld 11, and Hans U. Hainke, Bielefeld, both of Fed. Rep. of Germany, assignors to Hainke Volker, Bielefeld, Fed. Rep. of Germany

Continuation of Ser. No. 108,884, Dec. 31, 1979, abandoned.
This application Jan. 29, 1982, Ser. No. 343,808
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—42 **6 Claims**



1. An anchor bolt for anchorage in a bore, comprising

(a) a tension rod having a male screw-threaded portion terminating in a frusto-conical head portion diverging therefrom at a first angle of conicity; and

(b) a sleeve of polygonal cross-section having a female screw-threaded portion for engagement with said male screw-threaded portion of said tension rod, said female screw-threaded portion terminating in a frusto-conical bore diverging therefrom at a second angle of conicity less than said first angle, for engagement with said head portion of said tension rod;

(c) axially parallel grooves being provided in the polygonal sides of said sleeve so as to define outwardly cornered segments therebetween, the conicity of said frusto-conical bore and the depth of said grooves being so selected that they converge to a substantial degree at the end of said bore remote from said female screw-threaded portion,

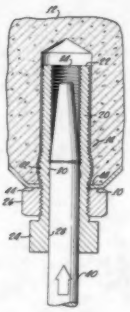
whereby, upon engagement of said head portion against said bore, said segments are forced arcuately outwardly by sequential tearing of said grooves from the trailing end to the leading end of said sleeve.

4,408,938

EXPANSION SLEEVE

James V. Maguire, 16862 Pacific Coast Hwy., Huntington Beach, Calif. 92649

Filed Aug. 24, 1981, Ser. No. 295,724
Int. Cl.³ F16B *13/10*
U.S. Cl. 411—71 **7 Claims**



1. An expansion sleeve comprising

a hollow elongated member having inner and outer ends and a bore,

projection means formed in said bore between said sleeve ends and projecting inwardly to form an opening smaller than the diameter of said bore, whereby a tapered tool may be driven into said bore and through said opening of said projection means to expand a portion of said sleeve adjacent said projection means,

means for pulling said sleeve outwardly of a sheet member having a hole through which said sleeve has been inserted to press said expanded sleeve section against said sheet member,

said sleeve being internally threaded for at least a portion of its length between said projection means and said inner end, whereby said opening in said projection means may be expanded by said tool to the size of said bore and an externally threaded hanger may be inserted through said outer end into threaded engagement with said internal threaded portion of said sleeve to maintain said expanded sleeve portion in expanded condition and to urge said inner end and said expanded sleeve portion against said sheet.

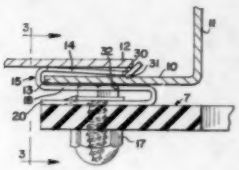
4,408,939

COMPOSITE FASTENER FOR ATTACHING SPLASH GUARD

Henry W. Graff, Elgin, and Lloyd A. Erickson, Park Ridge, both of Ill., assignors to Pathfinder Auto Lamp Company, Niles and Illinois Tool Works Inc., Chicago, both of, Ill.

Filed Mar. 5, 1981, Ser. No. 240,801
Int. Cl.³ F16B *37/04*
U.S. Cl. 411—112 **6 Claims**

1. A composite fastener for use in attaching a splash guard to a free edge of an exposed flange in vehicle wheel well, comprising, in combination: a sheet metal S-clip; a washer head screw; and, a nut for said screw; said sheet metal S-clip having planar generally parallel outer legs and a planar intermediate leg, said intermediate leg having a first slot therein extending inwardly from one end of said intermediate leg toward the opposite end thereof and said first slot having a width to slidably receive the head of said washer head screw without permitting rotation of said screw therein, and the end of said first slot adjacent said one end of said intermediate leg being open and merging into an opening in the adjacent loop connecting said one end of said intermediate leg with the proximal end of a first one of said outer legs, and the second and remaining outer leg having a second slot therein open at one end and extending inwardly from the distal end of said second outer



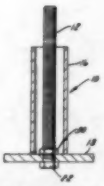
leg, said first and second slots being in overlying registration, the shank of said screw being received in said second slot and projecting from said second outer leg and said S-clip at approximately a right angle thereto, said free edge of said wheel well flange being receivable in the space between said first outer and intermediate legs, said screw shank being passable through said splash guard, and said nut being retaied on the distal end of said screw shank.

4,408,940

BOLT ANCHOR ASSEMBLY

Mark L. Fischer, P.O. Box 627, Merton, Wis. 53056

Filed Sep. 8, 1981, Ser. No. 300,011
Int. Cl.³ F16B *39/22*
U.S. Cl. 411—258 **5 Claims**



1. A bolt anchor assembly comprising

an anchor member adapted to be imbedded in concrete and a bolt positioned within said anchor member and extending beyond the end of the anchor member for attaching a machine to a concrete surface,

said anchor member including a hollow tubular portion and a base plate secured to the bottom of said tubular portion,

said hollow tubular portion having inside diameter greater than the diameter of said bolt,

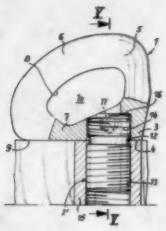
said base plate having a central opening and extending outwardly beyond the outside perimeter of the tubular portion, and

said bolt having a head at one end and a threaded section at the other end, said bolt being positioned in said opening with the head of said bolt bearing on the bottom of said base plate, whereby said base plate and the head of said bolt will become imbedded in the concrete.

4,408,941
EYEBOLT

Heinz D. Motz, Solingen, Fed. Rep. of Germany, assignor to Firma Friedrich Schroeder, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,462
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009789
Int. Cl.³ F16B *35/00*
U.S. Cl. 411—378 **15 Claims**

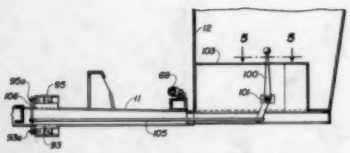


1. An eyebolt adapted to be connected to a load and to be coupled to a load hoisting means, comprising a threaded shank connected by a constricted portion to a one-piece eye portion having an eye opening therein and having a shoulder which limits the depth of screwing of the threaded shank and which shoulder is adapted to rest against the load, the inner surface of the eye opening which faces away from the threaded shank being so curved that its center is located at least approximately in the plane of the underside of the shoulder facing the threaded shank and aligned with the axis of the threaded shank.

4,408,942
CONTROL LINKAGE FOR TWO FUNCTION BALE PICKUP

L. Dennis Butler, Kingsburg, and J. Dwayne Wells, Selma, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

Filed Jun. 23, 1981, Ser. No. 276,603
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.5 **8 Claims**



6. In a bale wagon for picking up round bales of crop material from the field, accumulating a plurality of said round bales and transporting the accumulated bales to a preselected storage location to be unloaded from the bale wagon, the bale wagon having a mobile frame adapted for movement across a field; a bale pickup means mounted on said frame for individually engaging bales of crop material on the ground and elevating said bales onto the bale wagon; a load bed supported on said frame for accumulating a plurality of said bales, said load bed including a receiving portion on which said bale pickup means deposits bales picked up from the field; means for arranging and positioning bales deposited on said load bed by said bale pickup means; and power means for operatively powering said bale pickup means and said means for arranging and positioning said bales, an improved bale pickup means comprising:

a subframe pivotally mounted by a pivot on said frame for movement in a generally vertical plane, said subframe including a first arm projecting from said subframe and a spaced apart second arm pivotally connected to said subframe for movement toward and away from said first arm;

a first hydraulic cylinder interconnecting said subframe and said second arm for moving said second arm relative to said first arm to releasably engage a b..e of crop material therebetween;

a second hydraulic cylinder interconnecting said mobile frame and said subframe for rotating said subframe about said pivot to elevate a bale of crop material engaged between said first and second arms from the field to a position on said receiving portion of said load bed;

a first control valve supported on said frame in operative communication with said first hydraulic cylinder to control the flow of hydraulic fluid thereto;

a second control valve supported on said frame and spaced from said first control valve, said second control valve being in operative communication with said second hydraulic cylinder to control the flow of hydraulic fluid thereto;

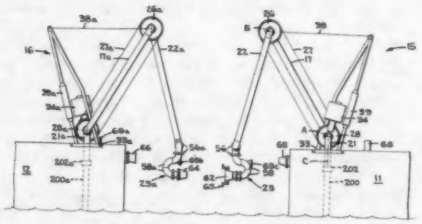
a control lever mounted on said mobile frame for selective movement in first and second generally opposing directions; and

a linkage assembly interconnecting said control lever and said first and second control valves to effect operation thereof by the selective movement of said control lever, said linkage assembly including a cross link interconnecting said first and second control valves and a connecting link interconnecting said cross link and said control lever to transfer movement from said control lever to said cross link, said connecting link being connected to said cross link at a point closer to said first control valve than to said second control valve.

4,408,943
SHIP-TO-SHIP FLUID TRANSFER SYSTEM

Louis S. McTamaney, Cupertino, and Frank P. Haley, Upland, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 27, 1981, Ser. No. 238,772
Int. Cl.³ B65G *67/60*
U.S. Cl. 414—138 **10 Claims**



1. A ship-to-ship fluid transfer system having remote control means for connecting a loading arm on one ship with a storage facility on another ship, said system comprising:

an articulated loading arm;

means for mounting said loading arm on a first ship;

a receiving means;

means for connecting said receiving means to said storage facility on a second ship;

means for sensing the distance and the direction of said receiving means relative to an outboard end of said loading arm and for developing signals proportional to said distance and to said direction;

means for using said signals from said sensing means to move said outboard end of said loading arm into operating engagement with said receiving means;

means for storing a set of parameters of a safe operating boundary for said loading arm; and

means for disconnecting said loading arm from said receiv-

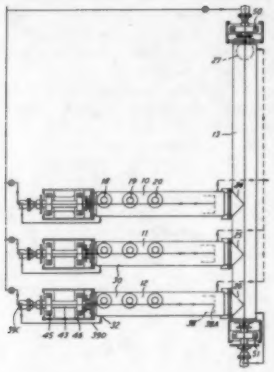
ing means when said loading arm moves outside said safe boundary.

4,408,944

CONVEYOR FOR REMOVAL OF BED DRAIN MATERIAL FROM A COAL-BURNING FLUIDIZED BED COMBUSTOR

Robert F. Christian, San Francisco, Calif., assignor to Jude Engineering, Inc., San Francisco, Calif.

Filed Nov. 7, 1980, Ser. No. 204,784
Int. Cl.³ F23J *1/02*
U.S. Cl. 414—216 **2 Claims**



1. Apparatus for conveying bed drain material from a fluidised bed combuster comprising:

(1) a helical gathering conveyer (**13**),

(2) a plurality of helical receiver conveyers (**10,11,12**) parallel to each other and at right angles to the gathering conveyer and having their discharge ends connected to and discharging into the gathering conveyer,

(3) said discharge ends of the receiver conveyers being spaced from the discharge end of the gathering conveyer a sufficient distance to ensure densifying of the bed drain material adequate to prevent blow through of the material under pressure from the combuster,

(4) a plurality of entry openings (**18,19,20**) in each receiver conveyer to receive said bed drain material,

(5) said entry openings (**18,19,20**) being spaced a sufficient distance from the discharge ends of the receiver conveyers to enable the material to be densified adequately to prevent blow through of the material under pressure from the combuster.

each of said receiver conveyers comprising:

(a) a non-rotary double walled cylindrical casing (**30**) having a jacket space between its walls,

(b) exit and entry means (**32,33**) for circulating water through the jacket space,

(c) a first water carrying tube (**38**) located rotatably within the casing,

(d) said first water carrying tube (**38**) having a helical conveyer flight on its outer surface located between it and said casing (**30**),

(e) said flight having a progressively longer pitch from its inlet end to near its outlet end,

(f) said flight having a closer pitch (**40A**) near its discharge end than the pitch (**40**) immediately preceding said discharge end,

(g) a second water carrying tube (**39**) located within the first water carrying tube (**38**) and extending through said first water carrying tube and extending out of one end of said first water carrying tube,

(h) an opening (**39B**) in said second water carrying tube (**39**) connecting the interior of the second water carrying tube with the interior of the first water carrying tube (**38**),

(i) means (**39D**) connecting the second water carrying tube to said entry means (**32**) to said jacket space in the casing (**30**),

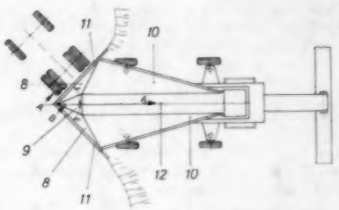
(j) a bearing tube (**43**) having an inner end extending a short distance into the first water carrying tube and its other end projecting out of said first water carrying tube and surrounding the second water carrying tube both within and outside of the first water carrying tube and spaced radially from the second water carrying tube to provide a space for exit of water from the interior of the first water carrying tube (**38**).

4,408,945

STATIONARY OR MOBILE RECEIVING BUNKER

Jürgen-Michael Wenzel, Düsseldorf; Werner Guderley, Bad Oeynhausen, and Ernst Hamel, Löhne, all of Fed. Rep. of Germany, assignors to PHB Weserhütte Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,826
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049236
Int. Cl.³ B65D *88/54*; B65G *47/90*; A01F *25/18*
U.S. Cl. 414—325 **5 Claims**



1. In a stationary or mobile receiving bunker adapted to be fed with bulk material, in particular by means of industrial trucks, with a delivery conveyor arranged under the receiving bunker,

the improvement which comprises two bunker walls enclosing the receiving bunker chamber on the side away from the direction of delivery, with straight lines running through their top edges and projected onto a horizontal plane each forming an angle $\alpha < 90°$ with the longitudinal axis of the delivery conveyor also projected onto the horizontal plane, said top edges of the two bunker walls enclosing the bunker chamber on the side away from the delivery direction having a common point of contact above the longitudinal axis of the delivery conveyor.

4,408,946

DUMPING HOPPER

James T. Haven, and Warren G. Haven, both of 537 N. Clark St., Orange, Calif. 92668

Filed Aug. 11, 1980, Ser. No. 176,675
Int. Cl.³ B66F *9/19*
U.S. Cl. 414—424 **4 Claims**

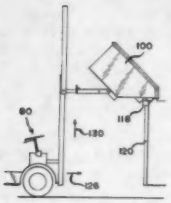
1. A dump hopper for transfer of particulate solids to a receiving hopper which comprises:

vertical rear and generally parallel sidewalls and an inclined front wall fixedly secured to a bottom wall defining an open-top chamber to receive said solids;

subjacent frame means including a fore frame having a first plurality of rails of lengths less than the length of said bottom wall and fixedly secured to the forward undersurface of said bottom wall and an aft frame pivotally interconnected thereto and having a second plurality of rails, each pivotally interconnected to a respective one of said

first plurality of rails along a hinge line intermediate the length of the bottom wall of said hopper, and interconnected by aft frame crossbar means;

first and second fork receptacle means on said fore and aft frame means, respectively, in alignment to receive a fork of a lift, immobilizing the pivotal interconnection of said fore and aft frame;



an open groove bracket carried on and laterally extending across the outside surface of said inclined front wall with coextensive lips along each edge thereof for engagement and coaction with the upper edge of said solids receiving hopper whereby said dump hopper can be fixedly engaged with the upper edge of said hopper to permit retraction of a fork from said first fork receptacle means, freeing the pivotal interconnection of said fore and aft frames, and permitting said hopper to tilt and dump its contents.

4,408,947

CONVEYOR ARRANGEMENT FOR A COMBINE HARVESTER

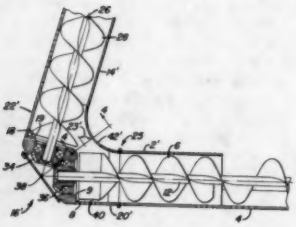
Ralph Lenski; Rolf W. Peiler, both of Zweibrucken, and Klaus H. Pauli, Homburg, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Apr. 28, 1981, Ser. No. 258,503

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016840

Int. Cl.³ B60P *1/40*; B65G *33/14*

U.S. Cl. 414—526 **8 Claims**



1. In a combine harvester, an improved screw conveyor system for receiving grain passing downwards from a cleaning shoe and discharging it to a receptacle above the shoe comprising:

a first generally horizontal conveyor leg including a first conveyor screw and a first cylindrical conveyor tube at least partially surrounding the screw and having an outboard end and disposed in a receiving relationship with the cleaning shoe for receiving grain and conveying it laterally in a first direction to the outboard end;

a second generally upright conveyor leg including a second conveyor screw and a second cylindrical conveyor tube at least partially surrounding the screw and having opposite upper and lower ends and disposed with its axis coplanar with the axis of the first conveyor leg and inclined from the vertical in a second direction opposite the first direction so that the upper end is substantially inboard of the outboard end of the horizontal conveyor leg;

an elbow connecting the first and second conveyor legs and including a pair of generally tubular socket portions for receiving axially the ends of the respective conveyor screws, each socket portion being defined in part by an internal wall of the elbow, each wall extending perpendicular to the axis of the respective leg, and spanning substantially the full diameter of its conveyor tube so that the juxtaposed walls meet at a surface of intersection and a passage having an inlet and an outlet and communicating with the respective horizontal and upright legs for permitting the transfer of grain between them, said passage being defined in part by the surface of intersection and, generally opposite it, an outer passage wall, so that the inlet and outlet of the passage register substantially only with portions of the circumferential periphery of the respective conveyor screws; and

means carried by the first conveyor screw, adjacent the outboard end, for impelling grain through the passage into the second tube.

4,408,948

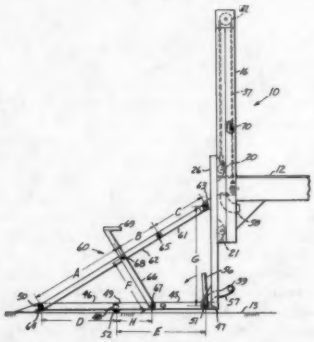
CONTROLLED-FOLDING AND CONTROLLED-UNFOLDING MULTIPLE SECTION PLATFORM ASSEMBLY

Morris D. Robinson, 179 Via Los Mira Dores, Redondo Beach, Calif. 90277

Filed Jan. 16, 1979, Ser. No. 3,988

Int. Cl.³ B60P *1/44*

U.S. Cl. 414—545 **14 Claims**



1. A controlled-folding and controlled-unfolding multiple-section platform assembly for a structural entry, said platform assembly comprising:

an inner platform section having an inner edge and an outer edge;

inner hinge means at said inner edge pivotally mounting said inner platform section for rotation around its inner edges, said inner hinge means being adapted to be mounted to structure associated with said entry;

an outer platform section having an inner edge and an outer edge;

outer hinge means pivotally joining the inner edge of the outer platform section to the outer edge of the inner platform section; and

fold control means comprising a first and a second rigid support member; first, second and third support hinge means, said first support member being adapted to be hinged to said structure at a hinge point above and substantially spaced from, said inner hinge means by said first support hinge means, said second support member being hinged to said outer platform section by said second sup-

port hinge means at a hinge point substantially spaced from the inner edge thereof, said first and second support members being hinged together by said third support hinge means at a location substantially spaced from the first and second support hinge means, a rigid co-ordinating member, and a first and a second co-ordinating hinge means, said first co-ordinating hinge means pivotally joining the co-ordinating member to the inner platform section at a first hinge point between and spaced from the inner and outer edges of said inner platform section, and said second co-ordinating hinge means pivotally joining the co-ordinating member to the second support member between and spaced from its respective hinge points;

whereby, when said inner platform section is substantially horizontal, said outer platform section is also substantially horizontal, the support members are aligned and support said outer platform section, and, when said inner platform is pivoted upwardly said fold control means causes the support members to fold toward one another and defines the angle of the other platform section relative to the inner platform section, said platform sections being substantially parallel to one another when the inner platform section is substantially vertical.

4,408,949

MECHANICAL DIGGER

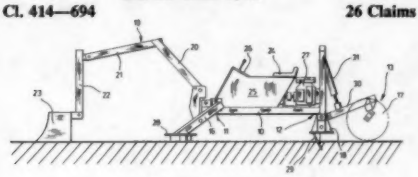
Brian H. Witty, Kettering, England, assignor to Mantis Excavators, Ltd., Corby, England

Filed Aug. 11, 1982, Ser. No. 407,125

Claims priority, application United Kingdom, Sep. 15, 1981, 8127880

Int. Cl.³ E02F *3/32*

U.S. Cl. 414—694 **26 Claims**



1. A mechanical digger adapted for use in excavation comprising:

a frame having a forward end, a rearward end and a middle portion located between said forward and rearward ends;

conrollable digging means mounted on said frame forward end for excavating;

front end support feet for supporting said frame forward end above ground;

middle support means for supporting said frame middle portion above ground;

wheel means mountable on said frame for supporting said frame above ground;

means for alternately and selectively mounting said front support feet or said wheel means to said frame forward end and wherein said frame rearward end includes wheel mounting means which cooperate with said front end mounting means to provide inerchangable mounting of said wheel means between said frame forward end and said frame rearward end, said front support feet being selectively mounted to said frame forward end during excavation operations and said wheel means being selectively mounted to said frame forward end for towing transportation of said digger by a towing vehicle and excavation operations when said digger is attached to said towing vehicle; and

means for raising and lowering the frame rearward end relative said frame middle and front to thereby raise said middle support means out of contact with the ground when said wheel means are mounted to said frame rearward end to allow digging means assisted movement of said digger on said wheel means during excavation.

4,408,950

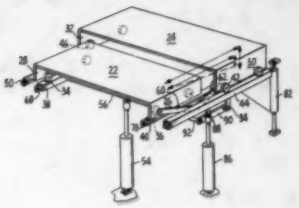
PRESS LOADER

Ben G. Laskey, 741 Hurlingame Ave., Redwood City, Calif. 95063

Continuation of Ser. No. 163,056, Jun. 26, 1980, abandoned. This application May 17, 1982, Ser. No. 379,168

Int. Cl.³ B65G *47/96*

U.S. Cl. 414—749 **5 Claims**



1. A press loader comprising a pair of first and second tables, said tables being telescopic and movable between a loading station and a horizontally spaced press operating station, means for moving said tables simultaneously and alternately between said stations, and an improved means for suppporting said tables comprising:

a first pair of parallel rails for supporting said first table, said rails extending between said loading station and said press operating station;

a second pair of parallel rails for supporting said second table, said rails extending between said loading station and said press operating station, said second pair of rails being parallel to and between said first pair of rails;

means for raising and lowering said first pair of rails between a loading position and a press operating position; and

means for raising and lowering said second pair of rails between a loading position and a press operating position.

4,408,951

FLUID DRIVEN ENGINE

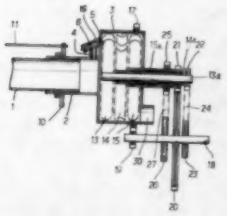
Tasuku Ishii, 32 Miyanowaki Aza Kayama Oaza, Tokiwamachi, Tamura-gun, Fukushima-ken, Japan

Filed Dec. 9, 1981, Ser. No. 329,203

Claims priority, application Japan, Dec. 10, 1980, 55-175135

Int. Cl.³ F01D *17/06*

U.S. Cl. 415—36 **7 Claims**



1. A fluid driven engine comprising:

a rotary hollow cylindrical shaft adapted to be rotatably mounted on a stationary fluid feed conduit for rotation around the axis of the stationary feed conduit;

a turbine housing coaxially secured to said rotary hollow cylindrical shaft for rotation with said cylindrical shaft and having at least one turbine rotatably mounted therein;

nozzle means in said housing connected between said cylindrical shaft and said turbine housing for directing fluid from said cylindrical shaft under pressure against said turbine for rotating said turbine, the reaction to the impact of the fluid on said turbine causing said housing to rotate;

a turbine shaft driven by said turbine;

an engine output shaft; and

transmission means connected between said turbine shaft, said housing and said engine output shaft and transmitting the rotation of said turbine and said turbine housing to said engine output shaft and limiting the speed of rotation of said turbine housing to a speed slower than the rotational speed of said turbine.

4,408,952

LATERAL CHANNEL PUMP

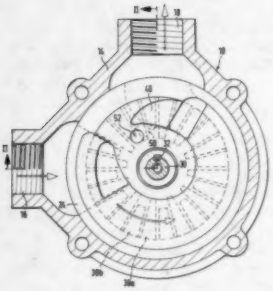
Friedrich Schweinfurter, Bergstr. 6, D-8541 Rottenbach, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,832

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014452

Int. Cl.³ F04D *5/00*

U.S. Cl. 415—53 T **8 Claims**



1. A lateral channel pump, comprising a housing provided with intake and outlet ports, a shaft extending into said housing, seal means sealingly engaged between said shaft and said housing, a rotor secured to said shaft, and a flow channel which starts from said intake port in said housing and leads to said outlet port in said housing through at least one lateral channel and also through blade compartments of said rotor, characterized in that the blade compartments are defined by a ring of blades of said rotor which alternate in length, towards the center of the rotor, between a long blade compartment and a short blade compartment, the lateral channel has a constant outer contour concentric with the center of the rotor and an inner contour tapering helically towards said outlet port, the spacing of the inner contour relative to said shaft at said intake port corresponds to the spacing of the long rotor blade compartment relative to the shaft and, at the outlet port, the spacing of the inner contour corresponds to the spacing of a short rotor blade compartment relative to the shaft.

4,408,953

HIGH EFFICIENCY CENTRIFUGAL PUMP

Pius J. Nasvytis, Avon, and George W. Jahrstorfer, South Windsor, both of Conn., assignors to Chandler Evans Inc, West Hartford, Conn.

Filed Jan. 6, 1982, Ser. No. 337,473

Int. Cl.³ F01D *1/10*; F04D *13/14*

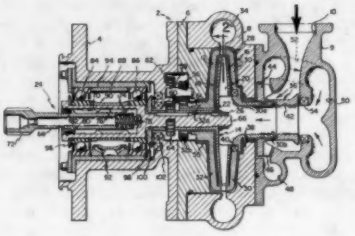
U.S. Cl. 415—62 **4 Claims**

1. In a high speed centrifugal fuel pump of the type having:

a housing with a pumping cavity therein, a main impeller mounted for rotation in the pumping cavity and a drive shaft assembly mounted in the housing for rotation and operatively connected to the main impeller for concurrent rotation at the same RPM, a shroud mounted for rotation in the housing surrounding the impeller in closely spaced relationship thereto, the improvement comprising:

a gear mounted on the drive shaft assembly;

a gear on the shroud;



two integral interconnecting gears in respective meshing engagement with the first and second mentioned gears and sized to rotate the second mentioned gear at one-half the RPM of the first mentioned gear whereby the shroud is rotated at an RPM one-half that of the drive shaft assembly; and seal means to isolate the gears from oil and fuel to minimize drag on the rotating gears.

4,408,954

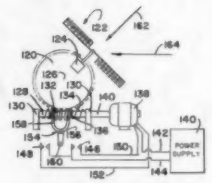
WINDMILL YAW AND SPEED CONTROLS

John L. Earle, P.O. Box 185, Forest Grove, Oreg. 97116

Filed Jul. 27, 1981, Ser. No. 287,456

Int. Cl.³ F03D *7/04*

U.S. Cl. 416—9 **45 Claims**



1. Yaw control apparatus for a horizontal windmill assembly mounted for angular movement about a vertical axis comprising

rotation means connected to the assembly for selectively rotating the assembly about the vertical axis,

sensor means connected to the assembly for sensing externally induced angular movement of the assembly about the vertical axis, and

control means connected to the sensor means and rotation means for activating the rotation means when the sensor means senses said angular movement to rotate the assembly in a direction opposite the angular movement.

4,408,955

WIND OPERATED WHEEL

Joseph A. Wagle, and Joseph H. Wagle, both of Indianapolis, Ind. 46278

Filed Jun. 18, 1980, Ser. No. 160,672

Int. Cl.³ F03D *7/06*

U.S. Cl. 416—119 **2 Claims**

1. A wind operated wheel comprising:

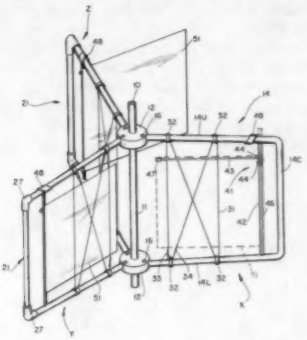
hub means rotatable on an axis;

a plurality of frame means projecting outward from said hub means;

vane mounting means in said frame means, said vane mounting means including vane pivot means, pivotally mounted in said frame means on pivot axes substantially parallel to and remote from said hub means axis;

vane stop means mounted in said frame means inboard from said pivot axes; and

flexible vane means secured to said vane mounting means and disposed within said frame means, said vane means being engageable with said stop means to drive the wheel in the direction of a wind when said vane means are on the upwind side of said vane stop means, and said vane means being pivotable away from said stop means as said frame means move said vane means to a position where said stop means are upwind of said vane means;



said stop means and pivot axis for the frame means lying in a plane containing the rotational axis for the wheel,

said stop means including a grid of wire lying in said plane,

said frame means including upper and lower radially extending arms and an outboard connector column;

said arms and column being tubular;

portions of said arms lying in said plane having superficial grooves therein facing the center of the area framed by said frame means;

said grid including a wire laced from grooves in the top arm to grooves in the lower arm, with sleeves encircling said arms and portions of said grooves and the laced wire in the grooves to retain said wire in said grooves.

4,408,956

FLIP-FLOP TURBINE VANE MODULE

William F. Price, Sr., 705 S. Fourth St., Folkston, Ga. 31537

Filed Nov. 27, 1981, Ser. No. 325,545

Int. Cl.³ F03D *1/06*

U.S. Cl. 416—119 **1 Claim**

1. In a system for capturing energy from air or fluid motion having a rotatable framework containing equal length supporting arms and legs similar to an H with said H cross-mark being the piviot point and having bearing connections at the ends of said arms and legs, cross-mark of said H being 90 degrees to wind direction, a *FLUID MOTION TURBINE VANE MODULE* working with an oppositely same said *FLUID MOTION TURBINE VANE MODULE* upon said rotatable supporting H framework for movement in a circular motion around the said H cross-mark piviot point, said turbine vane module comprising a main surface area wing mounted leading edge center said main surface area wing being a part of said module framework, having rod axles mounted top and bottom center said module framework for mounting said entire vane module in a parallel spaced relation from said pivioting point H of said supporting rotating framework said vane module bearing mounting method upon said supporting H framework allowing free pivioting at said spaced distance of said module from said piviot point of said supporting H framework

said fluid motion vane module having a method of restricting its pivioting in relation to said H rotatable supporting framework to 20 to 30 degrees inward and 20 to 30 degrees outward the tangent of the circular rotation at the said H rotatable supporting framework bearing into which said fluid motion vane module is mounted

said module framework structure having extensions emerging laterally both top and bottom approximately 90 degrees in both directions from the width sides said main surface area wing extending outwardly sufficiently to support two auxilliary wings of about 66 percent the width said main surface area wing so when said auxilliary wings leading edges mounted in piviotal bearings, said bearings being part of and near the outward portions of said extensions and forward leading edge said main surface area wing by about 10 to 20 degrees, are able to piviot from a stopped position surfaces parallel said main surface area wing, stops being mounted upon said lateral extensions at positions about the same distance laterally as said bearings and less distant trailingly than said auxilliary wing width to said auxilliary wings trailing edges pivioting closed against and near said main surface area wing leading edge

said vane module operation being characterized by the continuing change of angular aspect in respect to wind direction and the changing position of its component wings such being that, for the 60 degrees of into-wind all wings are feathered to wind to present little drag, then about 30 degrees windward said H piviot point of said supporting structure at least two said component wings begin tacking into a diagonal position pushing strongly into wind, cross-wind the outer component auxilliary wing closes upon the main surface area wing causing additional thrust, upon beginning travel down-wind chord, said outer auxilliary wing causes the inner aspect of said main surface area wing and said module framework to flip rotatingly outward, said inner auxilliary wing adding driving surface area by closing its trailing edge inward to the leading edge of said main surface area wing then across down-wind rotation said wings receive diagonal thrust in opposite direction across the down-wind chord said supporting framework circular movement, finally said component wings being thrust into tacking position forwardly thence into the into-the-wind feathered position.

4,408,957

SUPERSONIC BLADING

John W. Kurzrock, and Peter C. Tramm, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1972, Ser. No. 227,795

Int. Cl.³ F01D *5/14*

U.S. Cl. 416—237 **6 Claims**

1. A compressor rotor blade cascade suited for supersonic gas entry conditions comprising a rotor body of circular cross-section and an annular row of blades extending from the body,

the blades being disposed with a substantial stagger angle, each blade having a leading pressure face and a trailing suction face, each blade including a spanwise portion the cross-sections of which are defined by at least four sides each deviating to the extent required from a straight line, the sides meeting at edges defining relatively abrupt changes in the contour of the perimeter of the blade cross-section, two of the said faces being defined by surfaces meeting at the leading edge and two by surfaces meeting at the trailing edge, each face of the blade being defined at least by two such surfaces extending chordwise and spanwise of the blade with adjacent surfaces meeting

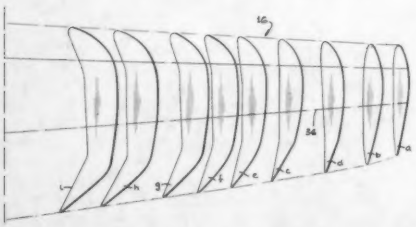
at a lateral edge extending spanwise of the blade; the blade pitch, the stagger angle, and the cross-section of the blades being such that the wave generated at the edge next downstream from the leading edge on the suction face of each blade intersects the leading edge of the next trailing blade, the leading edge shock wave of each blade intersects an edge of the next leading blade, and the trailing edge shock wave of each blade intersects a lateral edge on the pressure face of the next trailing blade, the faces being so directed downstream from each edge as to accord with the gas flow direction downstream of the waves and cancel the incident waves.

4,408,958

WIND TURBINE BLADE

Charles V. Schacle, Moses Lake, Wash., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 23, 1980, Ser. No. 219,467
Int. Cl.³ F03D 1/06
U.S. Cl. 416—237 **11 Claims**



1. A wind turbine blade, said blade being attached to a hub and comprising a spar structure having an inboard end adjacent said hub and an outboard end, said spar structure being substantial width and thickness at its inboard end and tapering toward its outboard end;

a plurality of rib members attached to said spar structure at intervals, contours of said rib members defining both leading and trailing edges of said blade, and a skin structure covering said spar structure and said rib members;

wherein the improvement comprises forming the said rib member nearest said hub of greatest length of all said rib members and of an assymmetrical airfoil-like configuration with substantial deflection of both leading and trailing edges toward the direction of the wind to provide a high lift cross-section,

rib members located at a point along said spar structure substantially over half the distance from said hub to said outboard end and from there to said outboard end are formed of a conventional assymmetrical airfoil configuration having a relatively low maximum lift coefficient and a relatively low angle of attack for maximum lift, and

intervening rib members located between said point and the said rib member nearest said hub tapering in cross-section from the high lift cross-section of said rib member nearest said hub through a series of ribs having progressively less width and less deflection of said leading and trailing edges to the conventional airfoil section of the rib member at said point,

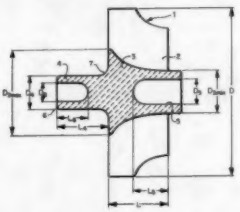
the length of said rib members including that nearest said hub and those extending at least one-fourth to one-third of the distance outwardly from the hub of said blade being such as to preclude substantial flow of air across said blade over an area whose radius is said distance when said wind turbine is rotating at a normal operating speed.

4,408,959

CERAMIC RADIAL TURBINE WHEEL

William D. Long, Tonawanda, N.Y., and Paul J. Rottenkolber, Wolfsburg, Fed. Rep. of Germany, assignors to Kennecott Corporation, Stamford, Conn. and Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

PCT No. PCT/US80/00419, § 371 Date Jul. 3, 1980, § 102(e) Date Jul. 3, 1980, PCT Pub. No. WO81/03047, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 17, 1980, Ser. No. 224,509
Int. Cl.³ F01D 5/34
U.S. Cl. 416—241 B **16 Claims**



1. A radial ceramic turbine wheel, comprising:

(a) a body portion, symmetrical about an axis;

(b) a plurality of blades, integral with and extending outwardly from the body portion; and

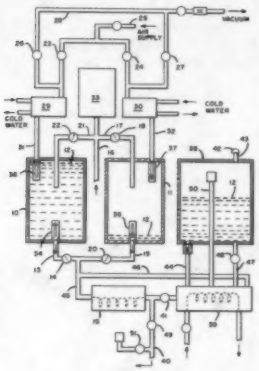
(c) a hub portion, integral and coaxial with the body portion, symmetrical about the axis, and connectable with a turbine shaft; characterized in that the body portion is provided with a hollow central core, on the side of the body portion opposite the hub portion; in that the blades extend outwardly partly from the hollow central core of the body portion, and partly from the solid part of the body portion; and in that the axial length of that part of the hollow central core of the body portion from which the blades extend does not exceed 60% of the axial length of the blades.

4,408,960

PNEUMATIC METHOD AND APPARATUS FOR CIRCULATING LIQUIDS

Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Bethel, Conn.

Filed Sep. 11, 1981, Ser. No. 301,358
Int. Cl.³ F04F 1/02
U.S. Cl. 417—54 21 Claims



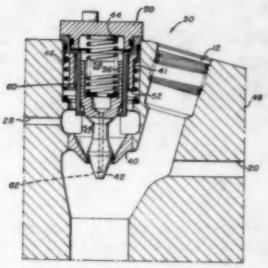
1. Method for causing the rapid recirculation of a liquid between a plurality of containers solely by adjusting the pressure of a gas exerted within each of said containers to superatmospheric, atmospheric and subatmospheric pressure, comprising providing a closed liquid circulation device including said plurality of containers and a liquid circulation system comprising a circulation conduit which communicates with each of said containers and which incorporates a work station, substantially filling a first container and said liquid circulation conduit with a circulation liquid while retaining the other container(s) substantially empty of said liquid, subjecting said filled container to superatmospheric pressure to force substantially all of said liquid out of said filled container and into said circulation conduit to said work station while subjecting a second container to subatmospheric pressure to such said liquid out of said circulation system to substantially fill said second container, opening said first container to atmospheric pressure to relieve the superatmospheric pressure therefrom, subjecting said first container or another container which is at atmospheric pressure to subatmospheric pressure, closing said filled second container to subatmospheric pressure and opening it to superatmospheric pressure to force substantially all of said liquid out to empty said second container into said circulation conduit to said work station, the subatmospheric pressure within said first or other container causing said liquid to be sucked from said circulation system to fill said first or other container, opening said empty second container to atmospheric pressure to relieve the superatmospheric pressure therefrom, closing said second container to atmospheric pressure and then subjecting it or another container which is under atmospheric pressure to subatmospheric pressure while closing said filled container to subatmospheric pressure and opening it to superatmospheric pressure to cause the recirculation of said liquid from said filled container, through said liquid circulation system into said second or other container which is under subatmospheric pressure.

4,408,961

JET PUMP WITH INTEGRAL PRESSURE REGULATOR

Bernard D. Laybourne, Farmington, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.

Filed Feb. 16, 1982, Ser. No. 349,009
Int. Cl.³ F04F 5/48
U.S. Cl. 417—189 14 Claims



1. A pressure regulator device comprising:

housing means, said housing means having a fluid flow passage extending therethrough, said housing means defining a first chamber which communicates at one end with said passage, said first chamber having an axis;

valve means, said valve means including a valve member having an axis and a pair of reaction surfaces, said valve member being at least in part positioned in said first chamber and being coaxial therewith;

means for supporting said valve member for axial movement in said first chamber;

nozzle defining means, said nozzle defining means having an axis and being at least in part positioned in said first chamber and circumscribing said valve member, said nozzle defining means being coaxial with said first chamber and axially movable therein relative to said valve member, said nozzle defining means cooperating with said valve member to define therebetween a sensing chamber within said first chamber and a variable area nozzle which communicates between said sensing chamber and said housing means passage, said nozzle defining means having a reaction surface disposed within said sensing chamber whereby the pressure in said sensing chamber will urge said nozzle defining means in a first direction, a first of said valve member reaction surfaces also being disposed within said sensing chamber whereby the pressure in said sensing chamber will urge said valve member in a second direction opposite to said first direction;

means for delivering a fluid at a reference pressure to said sensing chamber; and

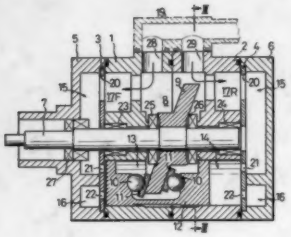
means for applying the pressure of the fluid in said housing means passage to said valve member second reaction surface to urge said valve member in the said first direction.

2. The apparatus of claim 1 wherein said pressure regulator device also functions as a jet pump and the reference pressure fluid is the driving fluid for said pump, passage of said driving fluid through said variable area nozzle inducing a flow of fluid through said housing means flow passage.

4,408,962
SWASH PLATE TYPE COMPRESSOR

Shozo Nakayama, Kariya; Shigeru Suzuki, Nishio, and Mitsuhiro Hattori, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 11, 1980, Ser. No. 139,241
Claims priority, application Japan, Sep. 14, 1979, 54-118129
Int. Cl.[3] F04B 1/16
U.S. Cl. 417—269 1 Claim

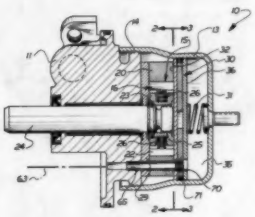


1. A swash plate type compressor comprising:
a pair of horizontal axially aligned cylinder blocks forming a combined block;
a swash plate chamber perforated in the axially central portion of said combined block;
a plurality of cylinder bores perforated in said combined block in the axial direction thereof;
a plurality of pistons, each of said plurality of pistons being slidably inserted within each of said plurality of cylinder bores;
a drive shaft disposed through said swash plate chamber and rotatably supported by said combined block in the axial portion thereof;
a swash plate disposed within said swash plate chamber and fixed to said drive shaft so as to be rotated therewith, said swash plate being connected with said pistons through bearing balls and shoes so as to reciprocate said pistons within said cylinder bores due to the rotation of said swash plate;
a pair of cylinder housing fixed to the ends of said combined block, one of said pair of cylinder housings having a shaft seal chamber in the axial portion thereof for accommodating a shaft seal member which is disposed around said drive shaft;
at least one suction chamber and at least one exhaust chamber perforated in each of said pair of cylinder housings, said suction chamber and said exhaust chamber being communicated with each of said cylinder bores through valve means;
at least one suction passage perforated in said combined block in the axial direction thereof between said cylinder bores adjacent to each other so as to be communicated with said swash plate chamber in the middle thereof;
two inlet ports for introducing a fluid from an outer pipeline and at least one outlet port for discharging a compressed fluid into an outer pipeline;
said two inlet ports being provided in said combined block so as to be aligned with each other in a longitudinal direction thereof; and
said two inlet ports opening into said swash plate chamber directly so that each of the wall surfaces defining said two inlet ports in the side of the center of said swash plate chamber in said longitudinal section is nearly in alignment with an inner edge portion of said swash plate when said swash plate is inclined to the utmost limit thereof in a front side or a rear side of said combined block in said longitudinal section, and so that each of the wall surfaces which define said two inlet ports in the side of said cylinder housings in said longitudinal section, is deviated from an outer edge portion of said swash plate by a predetermined distance outside of said outer edge portion of said swash plate when said swash plate is inclined to the utmost limit thereof in a front side or a rear side of said combined block in said longitudinal section.

4,408,963
POWER STEERING PUMP

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 7, 1980, Ser. No. 166,407
Int. Cl.[3] F04B 49/08, 49/02
U.S. Cl. 417—283 8 Claims



5. A pump for providing fluid flow to a system, said pump comprising a housing which partly defines a pumping chamber, pumping means in the pumping chamber, said pumping means having an inlet and outlet, said pumping means being operable to pump fluid from said inlet to said outlet, control means for maintaining a substantially constant flow of fluid to the system at pump speeds above a predetermined speed, said control means including a cheek plate defining with said housing said pumping chamber, said cheek plate having one side facing said pumping means and the other side facing a control chamber, spring means for biasing said cheek plate toward said pumping means and toward a position blocking said flow of fluid from said outlet to said inlet across said one side of said cheek plate, said cheek plate being movable upon an unbalance of forces acting thereon, said forces comprising first and second fluid pressure forces and the spring biasing force provided by said spring means, said second fluid pressure force being provided by fluid pressure in said control chamber and acting with said spring biasing force on said other side of said cheek plate to bias said cheek plate toward a position blocking flow of fluid from said outlet to said inlet across said one side of said cheek plate, said first fluid pressure force acting on said one side of said cheek plate and against said second fluid pressure force and said spring biasing force, and means for maintaining a continuous fluid flow from said system to said control chamber and from said control chamber to said inlet to effect balancing of said forces when said pump achieves said predetermined speed, said first and second fluid pressure forces acting respectively on first and second surfaces respectively provided on said one side and said other side of said cheek plate, said first and second surfaces having respectively first and second total areas that are unequal, and said means for maintaining a continuous fluid flow including orifices for directing fluid flow to and from said control chamber thereby providing a fluid pressure in said control chamber, the ratio of said fluid pressure in said control chamber to the pressure in the system at said predetermined pump speed being generally equal to the ratio of said second area to said first area.

4,408,964

VANE PUMP

Norihiro Mochizuki, Inuyama, and Fusayoshi Kugimiya, Minokamo, both of Japan, assignors to Kayaba Kogyo Kabushiki-Kaisha, Tokyo, Japan

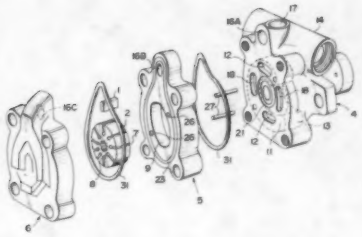
PCT No. PCT/JP80/00279, § 371 Date Jul. 7, 1981, § 102(e) Date Jul. 7, 1981, PCT Pub. No. WO81/01446, PCT Pub. Date May 28, 1981

PCT Filed Nov. 11, 1980, Ser. No. 285,186

Claims priority, application Japan, Nov. 13, 1979, 54-146838

Int. Cl.³ F04B 49/08

U.S. Cl. 417—310 2 Claims



1. A vane pump comprising a rotor (2) which has a plurality of vanes (1) arranged radially thereon and driven for rotation by a pump shaft (3), a cam ring (5) having a cam surface (9), said cam ring (5) accommodating said rotor (2) thereinside to permit said vanes (1) to remain in slidable engagement with said cam surface (9), a pump housing (4) having an inlet and an outlet, said pump housing (4) rotatably supporting a pump shaft (3) and having a slide surface (11) which is engaged with one end face of said cam ring (5) and the corresponding end face of said rotor (2), a cover plate (6) having a slide surface (11) which is engaged with the other end face of said cam ring (5) and the corresponding end face of said rotor (2), fastening means for locking said pump housing (4), cover plate (6) and cam ring (5) together with said cam ring (5) held between said pump housing (4) and said cover plate (6), said pump housing (4) being formed with a valve chamber (14) adapted to receive a flow control valve to control outlet flow, said pump housing (4) having a pressure chamber (13) which communicates with said valve chamber (14), said slide surface (11) of said cover plate (6) being formed with a pair of inlet ports (29), said cover plate (6) having a bifurcated passageway (16C) terminating at said inlet ports (29), said pump housing (4) having an excess return passageway (16A) at an excess fluie return side of said pump housing (4), said cam ring (5) being formed with a cam ring passageway (16B) providing fluid communication between said bifurcated passageway (16C) and said excess return passageway (16A), said pump housing (4) having a suction port (17) which communicates with said excess return passageway (16A), said suction port (17) being adapted to be connected to a reservoir, said suction port (17) being disposed adjacent to said valve chamber (14), said cam ring (5) having engagement surfaces (22, 24) engaging said slide surfaces (11) of said pump housing (4) and said cover plate (6), and a seal ring (31) on each of said engagement surfaces (22,24), said seal rings (31) extending around said cam surface (9) and partially around the outer periphery of said cam ring passageway (16B), whereby said cam ring passageway (16B) and said cam surface (9) are enclosed with said seal rings (31).

4,408,965

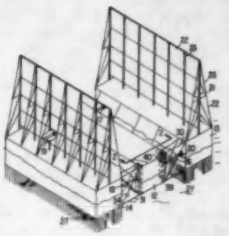
WAVE POWERED TURBINE

James R. Ekstrom, 5537 Blossom Vista Ave., San Jose, Calif. 95124

Filed Aug. 21, 1981, Ser. No. 294,978

Int. Cl.³ F03B 13/12; E02B 9/08

U.S. Cl. 417—331 8 Claims



1. Apparatus for deriving power output from wave action from a fluid comprising:

a barge;

a watertight cylinder in said barge and forming a cavity having a longitudinal axis;

a piston in said cylinder forming a pump;

a float;

means supporting said barge and float in the fluid to allow relative motion therebetween due to the wave action;

a plurality of rigid members fixed at opposite ends to said barge and float by ball-type connectors to allow universal movement therebetween while holding the barge and float apart;

a plurality of elongate flexible cables connecting said barge and float;

means fixing one end of said elongated cables to said barge and the other end to said piston such that relative motion between said barge and float will cause said piston to move along the longitudinal axis of said cylinder;

means supplying fluid to said cylinder;

a turbine adapted to be driven by fluid;

conduit means for carrying fluid from said cylinder to said turbine; and

power generating means connected to be driven by said turbine.

4,408,966

PUMP FOR SUPPLYING LIQUID FUEL

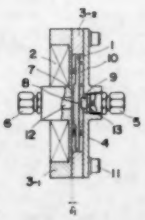
Teruo Maruyama, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 19, 1980, Ser. No. 218,305

Claims priority, application Japan, Dec. 27, 1979, 54-172941

Int. Cl.³ F04B 35/04; F01D 1/36; H02K 1/22

U.S. Cl. 417—356 10 Claims



1. A pump comprising housing means providing a rotor accomodating space and having an inlet channel and outlet

channel arranged substantially on the axis of the rotor accomodating space in communication therewith for the passage of a fluid;

a shaftless rotor completely and rotatably accomodated within the rotor accomodating space;

a stator for magnetically rotating the rotor within the rotor accomodating space; and

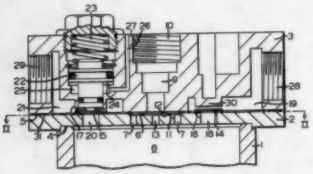
groove means formed on at least one of the surfaces of the rotor and the surfaces of the rotor housing means, whereby when the rotor is magnetically rotated by the stator, the fluid is forced forward by the groove means, the rotor being radially and axially supported in the rotor accomodating space solely by a fluid bearing provided by the fluid and the groove means.

4,408,967

PISTON CYLINDER AND HEAD FOR COMPRESSORS

Herbert Unger, Springe, and Gunther Meise, Hanover, both of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,287
Int. Cl.³ F04B *21/02*
U.S. Cl. 417—571 **7 Claims**



1. A piston cylinder and head arrangement for compressors comprising:

(a) a piston cylinder housing;

(b) a cylinder head;

(c) a valve plate secured between said cylinder housing and said cylinder head;

(d) said cylinder head having formed therein at least one intake chamber open to atmosphere, at least one discharge chamber provided with at least one discharge outlet and at least one atmospheric chamber provided with at least one atmospheric opening;

(e) an intake valve operably disposed adjacent one side of said valve plate;

(f) a discharge valve operably disposed adjacent said one side of said valve plate;

(g) an atmospheric vent valve operably disposed adjacent said one side of said valve plate;

(h) a sealing gasket disposed between said valve plate and said cylinder head for sealing said atmospheric chamber from said intake chamber and said intake chamber from said discharge chamber and for providing a valve seat for said discharge valve and said vent valve;

(i) said valve plate having formed therein intake passage means for communicating between said intake chamber and a compression chamber formed in said cylinder housing upon operation of said intake valve to an open position coincidental with air intake by the compressor, a discharge passageway via which said compression chamber may be communicated with said discharge chamber upon operation of said discharge valve to an open position responsively to discharge pressure coincidental with pression operation of the compressor and a vent passageway via which said compression chamber may be communicated with said atmospheric chamber, and

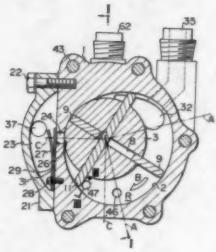
(j) piston means operably disposed in said cylinder head for controlling said vent valve to an open position when said discharge valve and said intake valve are closed and to a closed position when either said discharge valve or said intake valve are open, said piston means being effective according to a predetermined pressure reached in said compression chamber.

4,408,968

ROTARY COMPRESSOR

Mitsuo Inagaki; Hideaki Sasaya, and Seitoku Ito, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 11, 1981, Ser. No. 233,431
Claims priority, application Japan, Mar. 12, 1980, 55-31828
Int. Cl.³ F03C *2/00*
U.S. Cl. 418—15 **6 Claims**



1. A rotary refrigerant compressor comprising:

a housing having therethrough a cylindrical bore and a discharge opening formed through the wall of said housing and communicating with said cylindrical bore;

a discharge chamber disposed downstream of said discharge opening and communicating therethrough with said cylindrical bore;

end plates attached to the axial ends of said housing to close the open axial ends of said cylindrical bore, respectively;

a rotor rotatably disposed in said cylindrical bore and having an axis extending in an eccentric relation to the axis of said cylindrical bore;

a plurality of vanes slidably mounted in said rotor, each of said vanes cooperating with the adjacent vane, the wall surface of said cylindrical bore in said housing, the outer periphery of said rotor and said end plates to define a working chamber, said working chambers having their volume changed, during one revolution of said rotor, to compress fluid to discharge the compressed fluid through said discharge opening into said discharge chamber;

first passage means having one end thereof opening to said cylindrical bore in said housing and the other end communicating with said discharge chamber, said one end of said first passage means being positioned at an area adjacent to and including a location where the leading one of the adjacent pair of vanes is positioned when the working chamber defined between the adjacent pair of vanes has its volume starting to decrease;

first check valve means provided in said first passage means for allowing the working chamber associated said first passage means to be communicated therethrough with said discharge chamber to directly introduce the fluid within the working chamber into said discharge chamber only when the associated working chamber has its volume decreased and pressure increased higher than normal discharge pressure in order to avoid damage due to the presence of liquid refrigerant in said working chamber;

second passage means having one end thereof opening to said cylindrical bore in said housing and the other end communicating with said discharge chamber, said one end of said second passage means being positioned at a location where said one end of said second passage means together with said discharge opening is communicated with the working chamber defined between the adjacent pair of vanes with the working chamber having its volume

decreased and being communicated with said discharge opening; and

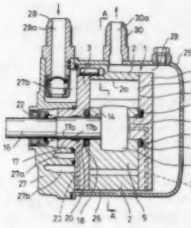
second check valve means provided in said second passage means for allowing the working chamber associated with said second passage means to be communicated therethrough with said discharge chamber only when the associated working chamber has its volume decreased and pressure increased higher than a predetermined value in order to avoid damage due to the presence of a liquid refrigerant in said working chamber, the passage of which through said discharge opening is so restricted as to cause a pressure rise in said working chamber.

4,408,969

VANE COMPRESSOR HAVING IMPROVED ROTOR SUPPORTING MEANS

Haruhiko Takada, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed May 20, 1981, Ser. No. 265,578
Claims priority, application Japan, May 31, 1980, 55-72935
Int. Cl.³ F04C *18/00, 29/02*
U.S. Cl. 418—93 **13 Claims**



1. In a vane compressor including: a pump housing comprising an annular peripheral wall member having an endless camming inner peripheral surface, and first and second end wall members secured to opposite ends of said annular peripheral wall member; a cylindrical rotor rotatably received within said pump housing, said rotor having a plurality of axial slits formed in an outer peripheral surface thereof; a plurality of vanes radially movably received in said slits; and a drive shaft coupled to said rotor for causing rotation of said rotor in unison therewith, said drive shaft being formed of a member separate and discrete from said rotor;

the improvement wherein:

said rotor has an internal space formed at a central portion thereof in communication with said slits, said rotor having opposite end wall faces, and first and second axial through holes extending from said internal space to respective opposite end faces thereof, said first end wall member of said pump housing having an axially extending bearing through hole formed at a central portion thereof, said drive shaft extending through said bearing through hole of said first end wall member and having an end portion thereof fitted in said first axial through hole of said rotor and rigidly secured to said rotor at said first axial through hole to radially support said rotor for rotation in unison therewith;

said drive shaft having an end face thereof located on substantially the same plane with a corresponding one of said opposite end wall faces of said internal space of said rotor;

said second end wall member having a support shaft projecting therefrom and fitted in said second axial through hole of said rotor to radially support said rotor for rotation relative thereto; and

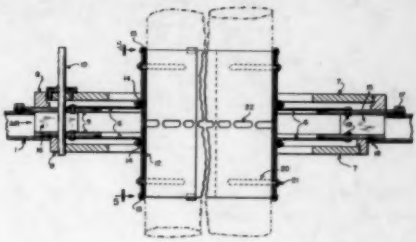
said support shaft extending toward said internal space substantially as far as the other end wall face of said internal space of said rotor.

4,408,970

STABILIZING AIR RING APPARATUS

Franz Bustin, Rochester, and Charles K. Bloomer, Newark, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 105,350, Dec. 19, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 284,862
Int. Cl.³ B29D *7/22*
U.S. Cl. 425—72 R **7 Claims**



1. A system for extruding tubular thermoplastic comprising:

an extrusion die;

a cylindrical sleeve downstream from said die for receiving said tubular thermoplastic therethrough, said sleeve comprising a plurality of slidably interconnected arcuate plates;

a plurality of interconnected iris mechanisms spaced along the outer surface of said cylindrical sleeve, each of said iris mechanisms including a plurality of iris members, each of said iris members being connected to a respective one of said arcuate plates; and

means for directing a cooling gas stream through said cylindrical sleeve to said tubular thermoplastic to provide a mantle of said cooling gas between the inner surface of said cylindrical sleeve and the outer surface of said tubular thermoplastic for cushioning, stabilizing and increasing the cooling period of said tubular thermoplastic advancing through said cylindrical sleeve;

whereby operation of said interconnected iris mechanisms changes the diameters of said cylindrical sleeve and said tubular thermoplastic.

4,408,971

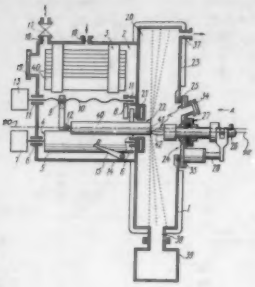
GRANULATION APPARATUS

Viktor N. Karinsky, bulvar Novoselovoi, 10, kv. 43, Odintsovo Moskovskoi oblasti; Viktor T. Musienko, ulitsa Molodezhnaya, 4, kv. 286, and Sergei G. Glazunov, ulitsa Bakinskaya, 29, kv. 90, both of Moscow, all of U.S.S.R.

Filed Mar. 27, 1978, Ser. No. 890,501
Int. Cl.³ B01J *2/04*
U.S. Cl. 425—8 **13 Claims**

1. An apparatus for producing powdered or granular particles comprising: a sealed chamber with a lid in the form of a conical funnel expanding toward said chamber, a concentrated heat source having an axis arranged on an inclined lateral wall of said conical lid on one side of said chamber, means for feeding and rotating the end of a billet which enters the chamber through an opening in the opposite side of said chamber from said lid into contact with said heat source whereby the

end of the billet is melted and the molten material is removed from the billet by centrifugal force in the form of small drop-



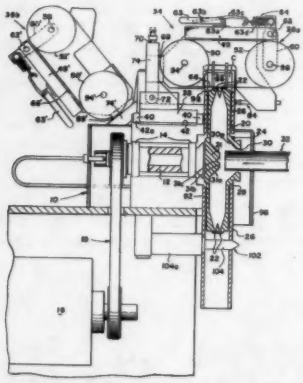
lets which are solidified in the chamber and wherein the axis of said heat source is displaced from the axis of the billet.

4,408,972

CENTRIFUGAL PELLETIZERS

James D. Layfield, Bay City, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.

Filed Feb. 17, 1982, Ser. No. 349,575
Int. Cl.[3] B22D *11/01*
U.S. Cl. 425—8 17 Claims



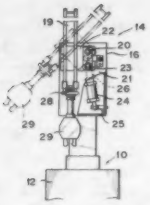
1. In a centrifugal plastics pelletizer for forming pellets from molten plastic material; a frame; a hollow disc-like rotor comprising side walls and a rim wall journaled on said frame and having an opening in one of its side walls for admitting plastics material thereto; there being a series of circumferentially spaced orifices in the rotor at the periphery thereof; a housing section mounted on said frame adjacent said rotor and including side walls connected by an outer wall; said housing being open to said rotor at its inner side to receive strands of material extruded through said orifices; a knife mounted at a predetermined fixed location within said housing and extending transversely to said orifices at a spaced distance from them for severing the strands of material into pellets, as the rotor rotates; a cooling and collecting duct extending generally tangentially from said housing generally in the plane of said knife; said duct having means for creating a coolant spray near its mouth; and means for driving said rotor at a selected rate of rotation to move said strands against said knife with sufficient velocity to provide the momentum to move the severed pellets through to be quenched in said coolant spray.

4,408,973

INJECTION MOLDING MACHINE

Toshiaki Tanaka, Tokyo, Japan, assignor to The Sailor Pen Co., Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,070
Claims priority, application Japan, Jun. 4, 1981, 56-81583[U]
Int. Cl.[3] B29F *1/14*
U.S. Cl. 425—139 4 Claims



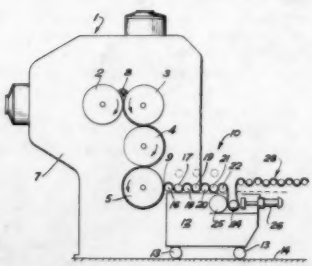
1. An injection molding machine comprising:
a stationary machine portion,
double-acting, fluid-operated cylinder means mounted vertically on the stationary machine portion and adapted to be moved between a removal position in which a molded part can be removed from the mold and a discharge position in which the molded part can be placed on a preselected unloading location, said cylinder means having a piston rod which has a chuck mechanism mounted thereon for grasping the molded part,
means for shifting said cylinder means between said removal and discharge positions,
a source of pressurized fluid for actuating said cylinder means to extend and retract said position rod, and
a control circuit coupling said cylinder means directly to said source of pressurized fluid to move said piston rod at higher speed when said cylinder means is in said removal position and for connecting said cylinder means to said source of pressurized fluid through a restricted flow path to move said piston rod at lower speed when said cylinder means is in said discharge position.

4,408,974

MOBILE FILM STRETCHING UNIT

Rinaldo I. Comerio, Busto A., Italy, assignor to Comerio Ercole, S.p.A., Busto A., Italy

Filed Jan. 20, 1982, Ser. No. 340,865
Int. Cl.[3] A01J *21/00*
U.S. Cl. 425—194 12 Claims



1. In a take-off unit positionable adjacent to the final calender roll of a calender installation for processing plastic film and including a bed of stretching rollers for applying stretching forces to said plastic film, the improvement comprising means connected to alternate rollers of said bed of rollers for moving

said alternate rollers vertically in unison while continuously rotating the moving rollers.

4,408,975

TABLET PRESS

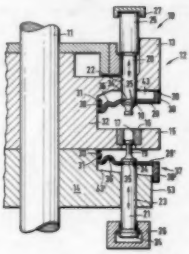
Adolf Hack, Sinnersdorf, Fed. Rep. of Germany, assignor to Emdener Strasse, Cologne, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 328,939

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049597

Int. Cl.³ B30B *11/08*

U.S. Cl. 425—231 **12 Claims**



1. In a tablet press comprising a plurality of dies, a plurality of upper and lower rams each having a ram shaft, a plurality of ram guides, and support means for supporting the dies and the ram guides, the arrangement being such that each ram is mounted for reciprocation in an associated one of said ram guides, and each pair of one of said upper and one of said lower rams cooperates with a respective one of said dies; the improvement comprising an upper intermediate wall generally peripendicular to the axis of said upper ram shafts having a plurality of holes, one for the passage of each upper ram shaft, means for maintaining the relative position of said wall with respect to each of said upper ram shafts, said upper intermediate wall engaging at its edges with the support means to form a dust barrier between the dies and the upper ram guides, and a lower intermediate wall generally perpendicular to the axis of said lower ram shafts having a plurality of holes, one for each lower ram shaft means for maintaining the relative position of said wall with respect to each of said lower ram shafts, said lower intermediate wall engaging at its edges with the support means, to form a dust barrier between the dies and the lower ram guides.

4,408,976

APPARATUS FOR THE RECOVERY OF THERMOPLASTIC FROM PIPING FOR REPROCESSING

Ray A. Parker, Jr., Browawood, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 9, 1981, Ser. No. 281,755

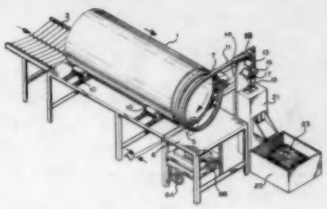
Int. Cl.³ A23P *1/00*

U.S. Cl. 425—301 **3 Claims**

1. An apparatus for preparing thermoplastic piping for recovery of the thermoplastic comprising in combination:

(a) means for cutting said pipe into a continuous spiral ribbon,

(b) means for straightening said continuous spiral ribbon into a continuous ribbon of thermoplastic, at least temporarily, without substantial curvature, said means comprising three rollers spaced so that a first roller and a second roller form a compression nip between which said continuous spiral ribbon is passed, said second roller driven in a direction to forward said continuous spiral ribbon between said first roller and said second roller with a third roller spaced in relation to the other rollers to form a compression nip with said second roller said nip removed on the face of said second roller at an angle of about 30 to about 60 degrees downstream of said first roller, and



(c) means for cutting said continuous ribbon without substantially curvature into pieces.

4,408,977

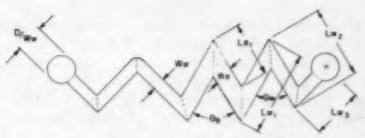
SPINNERET ORIFICE CROSS-SECTIONS

Bobby M. Phillips, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1982, Ser. No. 391,082

Int. Cl.³ D01D *3/00*

U.S. Cl. 425—382.2 **10 Claims**



1. A spinneret defining at least one spinneret orifice the planar cross-section of which defines intersecting quadrilaterals in connected series with the L/W of each quadrilateral varying from 2 to 10, the improvement being that one or more of the defined quadrilaterals is or are characterized by its or their width being greater than the width of the remaining quadrilateral(s), with the wider quadrilateral(s) defining body section(s) and with the remaining quadrilateral(s) defining wing members.

4,408,978

ADVANCEMENT APPARATUS FOR CONCRETE SCREED

Joe M. Owens, 16 Pebblewood Trail, Naperville, Ill. 60540

Filed Oct. 6, 1981, Ser. No. 309,005

Int. Cl.³ B28B *1/08, 17/00*; E01C *19/38*

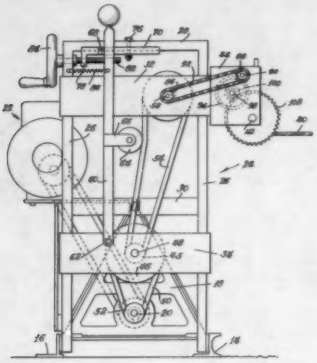
U.S. Cl. 425—456 **8 Claims**

1. An apparatus for automatically advancing a concrete screed as the screed tamps and levels concrete, the screed having a driven shaft for imparting vibrations to the concrete, comprising

a. cable reeling means attached to the concrete screed for winding a drive cable thereupon, the cable being adapted for attachment to a fixed location such that winding of cable on said reeling means propels the concrete screed toward the fixed location,

b. power transfer means connected to the driven shaft and said cable reeling means for imparting power from said driven shaft to said cable reeling means, said power transfer means including a driven pulley drivingly attached to said driven shaft and a slave pulley drivingly attached to said cable reeling means, and an endless belt loosely

mounted about said pulleys such that said driven pulley normally will not drive said belt, and



c. means to tension said belt between said pulleys to cause said driven pulley to drive said slave pulley through said belt.

4,408,979

APPARATUS FOR STRETCHING OF FASTENERS

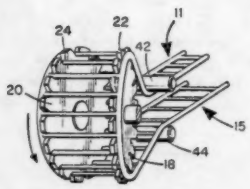
David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 941,083, Sep. 11, 1978, Pat. No. 4,276,255, which is a division of Ser. No. 721,774, Sep. 9, 1976, abandoned. This application Sep. 24, 1980, Ser. No. 190,138

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.³ B29C *17/02*

U.S. Cl. 425—383 **10 Claims**



10. Apparatus for stretching the filaments of plastic fastener stock, said stock comprising two opposed, longitudinally extending side members joined together along their lengths by transversely-extending filaments, the filaments being spaced apart along the side members at a substantially constant interval, said apparatus comprising:

(a) a pair of wheels each of which has a plurality of upstanding projections about its periphery, the leading edges of the projections on each wheel being spaced apart, at said constant interval;

(b) means for mounting said wheels to rotate at substantially the same peripheral speed but in different planes, the planes and extensions thereof converging to define an acute angle, the wheels being spaced apart to define an angled gap therebetween, the wheels most closely converging and diverging from each other at points 180° apart about the periphery of the wheels, the wheels diverging to a distance at least equal to the desired length of the stretched filament and converging to a distance less than the unstretched length of the filaments;

(c) means for feeding successive filaments of fastener stock into driving engagement with successive opposed pairs of said projections at a peripheral position where said wheels are converged to a distance less than the length of the unstretched filaments; and,

(d) means for removing stretched fastener stock from the wheels beyond their maximum separation positions.

4,408,980

DEVICE FOR MANUFACTURING CLOSED HOLLOW BODIES IN ELASTOMERIC MATERIAL

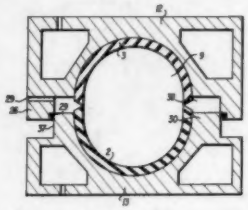
Achille Gallizia, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Continuation of Ser. No. 104,396, Dec. 17, 1979, abandoned, which is a division of Ser. No. 924,301, Jul. 13, 1978, Pat. No. 4,224,276. This application Oct. 30, 1981, Ser. No. 316,965

Claims priority, application Italy, Jul. 21, 1977, 25936 A/77

Int. Cl.³ B29H *5/00, 7/00*

U.S. Cl. 425—501 **8 Claims**



1. In a device for manufacturing hollow bodies, a mold for molding the complementary halves of the hollow body, comprising:

two covers having faces disposed face to face with each other, each cover having a cavity shaped as one-half of the exterior surface of the hollow body to be produced, said cavities being opened on the faces of the covers and communicating with each other when the mold is closed;

an annular cylindrical relief and an annular cylindrical depression provided one on the face of one cover and the other on the face of the other cover where the covers contact as the mold is closed, said relief and said depression cooperating after they contact to produce an annular chamber aligned with the area where the halves of the hollow body to be produced are joined, the volume of said annular chamber being reduced as the mold is closed;

sealing means on the innermost portion of said relief;

a duct in said relief, said duct having an inner opening in communication with said annular chamber and an outer opening in communication with a face of the cover having said relief; and

depressurizing means connected to the outer opening of said duct, whereby a tight depressurized annular chamber, which is aligned with the area where the halves of the hollow body to be produced are joined, is formed.

4,408,981

SUPPORT FOR AN INTERMEDIATE PLATEN OF A STACK MOLD

Paul Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems Inc., Bolton, Canada

Filed Jun. 18, 1982, Ser. No. 389,972

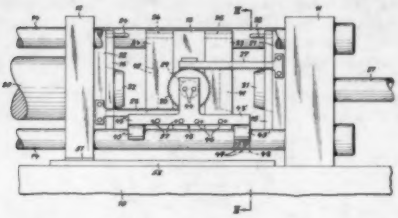
Int. Cl.³ B29C *3/02*

U.S. Cl. 425—589 **6 Claims**

1. In an injection-molding machine with two upper and two lower horizontal tie bars extending between a stationary outer platen and a fixed support mounted on a machine bed, a movable outer platen slidable along said tie bars, a first mold plate on said stationary platen confronting said movable platen, a second mold plate on said movable platen confronting said

stationary platen, and a pair of further mold plates carried on an intermediate platen between said outer platens subjected to correlated displacement with said movable platen between a mold-closed and a mold-open position,

the improvement wherein said intermediate platen is provided with two pairs of outrigger arms extending in opposite directions generally parallel to said tie bars, each outrigger arm terminating in a respective part-cylindrical shoe slidably engaging one of said tie bars at a location between said intermediate platen and one of said outer platens.



4,408,982

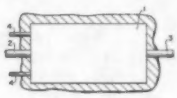
PROCESS FOR FIRING A FURNACE

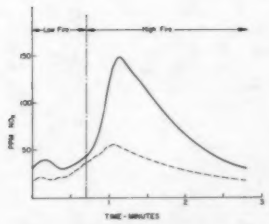
Hisashi Kobayashi, Tarrytown, and John E. Anderson, Katonah, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 5, 1982, Ser. No. 337,115

Int. Cl.³ F23M *3/04*

U.S. Cl. 431—10 **4 Claims**





1. In a process for firing a furnace by combusting fuel and oxidant gas, thereby producing furnace gases, wherein at least one jet of oxidant gas, selected from the group consisting of oxygen-enriched air and oxygen, and at least one jet of fuel are injected into the furnace aspirating the furnace gases into the oxidant jet prior to combustion, and wherein the furnace, in order to maintain a given temperature range which incorporates a specified temperature, is fired using alternating high and low firing rate periods, said low firing rate period being characterized by injection into the furnace of fuel and oxidant at flow rates such that substantial leakage of air into the furnace is caused to occur followed by a high firing rate period characterized by injection into the furnace of fuel and oxidant at flow rates, each greater than their respective flow rates during the low firing rate period, such that little or no air leakage into the furnace is caused to occur, the improvement comprising reducing NOx emissions to an acceptable level by delaying the injection of oxidant at the high firing rate at the start of the high firing rate period for a finite time no greater than S, wherein S is given by the formula:

$$S=(4.12\times10^5)V/FT$$

wherein:

S is the time delay in seconds,

V is the furnace volume in cubic meters,

F is the firing rate during the high firing period in kilocalories per second, and

T is the specified temperature in °K.

4,408,983

RECUPERATIVE BURNERS

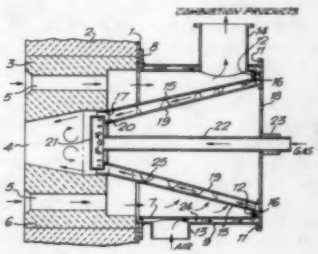
Jeffrey Masters; Manjit S. Saimbi, both of Solihull, and Roger J. Webb, Redditch, all of England, assignors to British Gas Corporation, London, England

Filed Jan. 5, 1981, Ser. No. 222,753

Claims priority, application United Kingdom, Aug. 29, 1980, 8027970

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—116 **13 Claims**



1. In a recuperative burner of the kind wherein, in use, fuel and combustion air are delivered separately by way of passages to a burner nozzle assembly in the form of a mixing nozzle or respective fuel and air nozzles which opens into a space for products of combustion, there being a combustion products passage for conducting products of combustion from the space to the exterior of the furnace, and the combustion air passage of the burner being disposed in use in heat-exchange relationship with the products passage to constitute a recuperator in which products of combustion indirectly preheat the combustion air passing along the air passage, the improvement wherein part of the length of the combustion air passage in heat-exchange relationship with the products of combustion is formed as a truncated substantially conical annular space which converges towards the burner nozzle assembly and wherein the remaining part of the length of the combustion air passage is formed as a substantially cylindrical annular space surrounding said conical annular space communicating with said conical annular space and with an air inlet.

4,408,984

BURNER FOR THE FORMATION AND COMBUSTION OF AN IGNITABLE MIXTURE OF A LIQUID FUEL AND COMBUSTION AIR

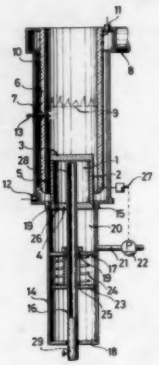
Siegfried Förster, Alsdorf, Fed. Rep. of Germany, assignor to Kernforschungsanlange Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,704

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013428; Dec. 18, 1980, 3047702

Int. Cl.³ F23D *13/40*

U.S. Cl. 431—354 7 Claims



1. In a burner for the formation and combustion of an ignitable mixture of a liquid fuel and combustion air; said burner having an axis, a fuel chamber fillable with said fuel having porous side walls permeable to said fuel for the through-passage of said fuel and a non-perforated closure plate; and a combustion chamber, said combustion chamber including a flow chamber providing for the inlet of combustion air at one end, means for heating said air, and an outlet for heated combustion air at the opposite end of said flow chamber communicating with the interior of said combustion chamber to form a combustion zone; and means for axially displacing said fuel chamber into and out of said combustion chamber so as to form an advanced and a retracted position, respectively; said porous side walls of the fuel chamber being selectively communicable with the interior of said combustion chamber in response to the axial position of said fuel chamber in said combustion chamber so as to facilitate passage of fuel through said porous side walls into said combustion chamber in said advanced position of said fuel chamber into said combustion chamber for the switching on said burner and to prevent passage of fuel through said porous side walls in said retracted position of said fuel chamber from said combustion chamber for switching off said burner.

4,408,985

METHOD OF FIXING HAZARDOUS SUBSTANCES IN WASTE FOUNDRY SAND

Mark A. Anderson, Rte. 1 Box 275, Graham, Ala. 36263; Robert W. Balliett, 330 Harland Rd., Norwich, Conn. 06360; Paul E. Link, Rte. 1 Box 518-C, Safford, Ariz. 85546, and Donald P. Satchell, P.O. Box 1258, Clifton, Ariz. 85540

Filed Sep. 14, 1981, Ser. No. 301,459

Int. Cl.³ F27B *14/00;* B28B *7/36;* B28C *5/06*

U.S. Cl. 432—1 7 Claims

1. A method of fixing hazardous concentrations of lead in waste sand comprising roasting the lead-containing sand at an elevated temperature for a period sufficient to chemically convert at least a portion of the lead to an acetic acid insoluble form.

4,408,986

METHOD FOR THERMAL TREATMENT OF WIRE LASHINGS AND A CONTINUOUS-HEATING FURNACE FOR PERFORMANCE OF THE METHOD

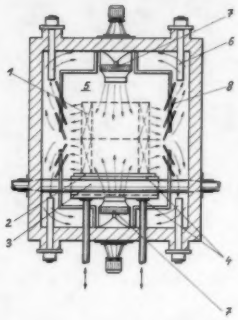
Soroyapour Soraya, Saarlouis; Gundolf Feld, Püttlingen-Köllerbach, and Fredy Wacker, Wadgassen-Differten, all of Fed. Rep. of Germany, assignors to Stahlwerke Rochling-Burbach GmbH, Volklingen, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,537

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3035032

Int. Cl.³ F21C *9/00;* F27D *3/00, 7/04;* C21D *9/52*

U.S. Cl. 432—6 6 Claims



1. In a method for the thermal treatment of horizontal wire rings wherein the rings are stacked one upon the other in a convection oven and hot gases are circulated around the rings, the improvement which comprises operating said oven at a temperature above 650° C., said stacked rings being in the resting state, and blowing the furnace gases simultaneously from points directly above and directly below the stack towards and into the center of the stack whereby flows are formed which impinge upon one another at the center and generate a turbulent flow condition in the center of the stack.

4,408,987

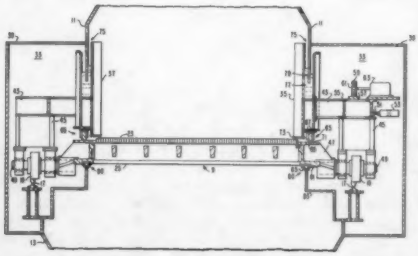
CIRCULAR TRAVELING GRATE MACHINE FOR PROCESS REQUIRING MINIMUM GAS LEAKAGE

John F. Oyler, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1982, Ser. No. 340,977

Int. Cl.³ F27B *9/26;* F26D *3/12;* C21B *7/16*

U.S. Cl. 432—137 10 Claims



1. A continuous traveling grate machine on which a burden is transported from a charging zone to a discharging zone for treatment in a processing zone therebetween by a process requiring minimum gas leakage of processing gas which is maintained at a predetermined pressure, said machine comprising:

a pair of substantially continuous rails defining a generally horizontal circular trackway;

a plurality of individual pallets, each of which is supported on a pair of forward and a pair of rear laterally disposed wheels which ride along said rails;

a plurality of hoods disposed above said pallets;

a plurality of windboxes disposed below said rails a portion of said windboxes and hoods defining said processing zone;

a charging hopper defining said charging zone through which a burden is charged onto said pallets, said burden maintaining a gas seal in said hopper;

a discharging hopper defining said discharge zone in which said burden is removed from said pallets, said hopper including means to at least in part provide a gas seal in said discharging hopper;

transverse sealing means substantially isolating said processing zone from said charging and discharging zones, each of said transverse sealing mean consisting of one of said hoods and one of said windboxes substantially vertically aligned and through which an inert gas is conveyed at a pressure greater than the predetermined pressure in the adjacent processing zone;

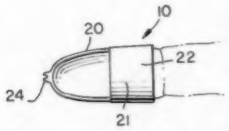
longitudinal sealing means substantially isolating said wheels from said processing zone and defining a tunnel through which said pallet wheels travel when transversing said processing zone, said tunnel being in fluid communication with said charging and discharging zone and having therein an inert gas maintained at a pressure greater than said predetermined pressure such that any gas leakage between said tunnel and said processing zone is from the former into the latter and said pallet wheels are substantially protected from contact with the processing gas during travel along said rails.

4,408,988

ORTHODONTIC APPLIANCE

Laurie M. Kaplan, 10 Monroe Blvd., Long Beach, N.Y. 11561

Filed Sep. 10, 1982, Ser. No. 416,484
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—3 **1 Claim**



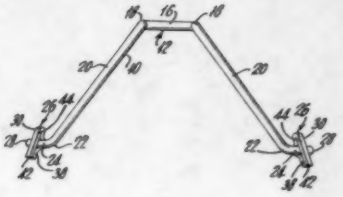
1. An appliance for tucking the ends of twisted wire ends of a ligature wire under an arch wire employed in an orthodontic apparatus, said appliance comprising a finger or thumb mounted structure having a pair of resilient bands engaging a finger or thumb of the user and substantially encircling the same forwardly of the first joint of the said finger or thumb said structure provided with a concave portion at the forward end of said appliance conforming to the convex surface of the first joint of the said finger or thumb of the user of the a flattened portion extending beyond said convex surface at the front end of said appliance, a centrally located notch formed at the forward end of said flattened portion and a plurality of serrations formed on the undersurfaces of said flattened portion, the notch and said serrations formed centrally of said flattened portion for engaging with the twisted wire ends of said wire for tucking the twisted ends of said wire under an arch wire employed in an orthodontic appliance.

4,408,989

ORTHODONTIC PALATAL ARCH WIRES FOR ACCURATE TRANSMITTAL OF CORRECTIONAL FORCES

James D. Cleary, Monrovia, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Feb. 5, 1982, Ser. No. 345,983
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—7 **9 Claims**



1. An orthodontic palatal arch wire for directional control over a pair of brackets, each of the brackets being mounted on an opposing molar in a patient's mouth and including a receiving unit on the lingual side thereof, comprising in combination:

a resiliently flexible wire having a length at least as great as the palatal distance between the pair of brackets, each end portion of said wire being snugly insertable into said receiving unit;

means disposed intermediate to the length of said wire for creating corrective forces in said end portions of said wire; and

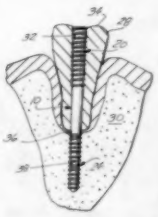
a torquing band transversely mounted on said wire proximate to each end, said torquing band being securable external to and in contact with said receiving unit after insertion so as to bear both forwardly and laterally against the receiving unit for transmitting said corrective forces therebetween.

4,408,990

ENDODONTIC DENTAL IMPLANT

Carl E. Misch, 3646 S. Elder, West Bloomfield, Mich. 48033

Filed Apr. 26, 1982, Ser. No. 372,080
Int. Cl.³ A61C *5/08*
U.S. Cl. 433—224 **2 Claims**



1. An endodontic implant for insertion through a tooth into the jaw bone of a user comprising:

an elongated post having first and second opposed ends;

the sides of the post tapering inward along the length of the post from a larger diameter first end to a smaller diameter second end;

a plurality of external threads formed on the post adjacent the first end and extending a predetermined distance along the post from the first end to define a first threaded section;

a plurality of external threads formed on the post adjacent the second end and extending a predetermined distance

along the post from the second end to define a second threaded section; and

the first and second threaded sections being spaced apart to define an intermediate, tapered, smooth-sided section on the post;

the lengths of the first and second threaded sections being selected so as to locate the intermediate smooth-sided section within the narrow apex region of the tooth.

4,408,991

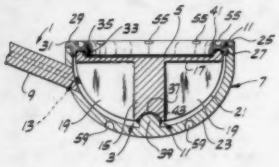
SELF-CLEANING MIRROR

Joseph R. Engel, 835 Hwy. 141, Fenton, Mo. 63026

Filed Dec. 14, 1981, Ser. No. 330,190

Int. Cl.³ A61B *1/24*

U.S. Cl. 433—30 **9 Claims**



8. A self-cleaning mirror as set forth in claim **6** wherein the ring has a series of recesses in its outer face at spaced intervals therearound adapted to receive complementary shaped projections on a first tool of a pair of tools, and said housing member has a plurality of recesses in its outer surface adapted to receive complementary shaped projections on the second tool of the pair, whereby by turning said tools relative to each other the ring may be threaded onto and off of said housing member.

4,408,992

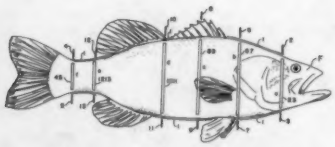
TAXIDERMY FISH BODY INSERT PIECE AND METHOD OF MAKING IT

John R. Rinehart, 3232 McCormick Dr., Janesville, Wis. 53545

Filed May 24, 1982, Ser. No. 381,319

Int. Cl.³ G09B *23/36*

U.S. Cl. 434—296 **4 Claims**



3. A taxidermy lightweight fish body insert piece slightly less in girth than the fish body itself, comprising:

a centerboard piece of substantially the same length as the fish body itself but slightly reduced marginally in width outline from the fish body itself by a predetermined measured amount, the centerboard piece being of fluted corrguated cardboard with the fluting lines substantially normal to the long axis thereof; and

first and second half-body masses of semi-elliptical cross section built up, respectively, on the first and second sides of said centerboard piece, of excelsior string-wrapped thereto, to a half-girth size reduced marginally from that of the fish body itself by said same predetermined measured amount.

4,408,993

CARD HOLDING TEACHING DEVICE

Anne M. Osborne, Rte. 2, Albion, Nebr. 68620

Filed Feb. 22, 1982, Ser. No. 350,984

Int. Cl.³ G09B *1/06*

U.S. Cl. 434—430 **5 Claims**

1. A teaching device comprising: a stiff body having a forward side having a substantially flat forward surface, a card holder formed of a piece of elongated flexible material extending with its elongation substantially parallel to said forward surface, said card holder being disposed adjacent said forward surface and having an elongated card-insertion edge defining a card-insertion side of said card holder, means for attaching said card holder between said body and said holder and in a manner whereby said holder can yield away from said forward surface of said body at the insertion edge of said card holder so that cards may be inserted under said insertion edge by a student, said elongated card holder being formed of a piece of material having its upper elongated edge doubled back upon itself so as to be of double thickness at its upper portion whereby its upper portion is more bulky than portions therebeneath whereby an elongated notch is formed between holder and body, said notch being larger at its uppermost portion so that a card can be inserted thereinto easily.

4,408,994

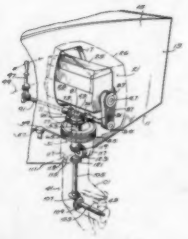
TRANSOM MOUNTED MARINE PROPULSION DEVICE WITH FORE AND AFT CRANKSHAFT AND POWER SHAFT

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 188,323, Sep. 18, 1980, Pat. No. 4,371,348. This application Mar. 26, 1981, Ser. No. 247,915

Int. Cl.³ B63H *21/26, 21/28*

U.S. Cl. 440—53 **17 Claims**



1. A marine propulsion device comprising a power head adapted to be fixedly mounted to the transom of a boat and including an internal combustion engine having a crankshaft which extends fore and aft and horizontally when said power head is mounted to the boat transom, a power shaft extending below said crankshaft in parallel relation thereto, means operatively connected between said crankshaft and said power shaft for rotating said power shaft in response to rotation of said crankshaft, a lower unit connected to said power head and including a rotatably mounted drive shaft extending perpendicularly to said power shaft, said lower unit further including a propeller shaft, and means including gearing for connecting said drive shaft and said propeller shaft, and a reversing transmission operably connected between said power shaft and said drive shaft for selectively driving said drive shaft in neutral, forward and reverse drive.

4,408,995

PROCESS FOR DYEING OR FINISHING TEXTILE FIBRE MATERIALS WITH FOAMED AQUEOUS LIQUOR CONTAINING ETHYLENE OXIDE-PROPYLENE OXIDE BLOCK CO-POLYMER

Christian Guth, Basel, and Jörg Binz, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,981

Claims priority, application Switzerland, Feb. 11, 1981, 903/81

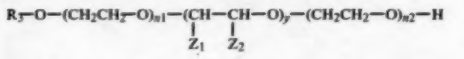
Int. Cl.[3] D06L *3/12;* D06B *1/14*

U.S. Cl. 8—477 27 Claims

1. A process for dyeing or finishing textile material using foam, which process comprises applying to said material an aqueous foam composition which, in addition to containing dye or finishing agent, contains a foamable system comprising water and

(A) an anionic surfactant and

(B) a non-ionic block polymer based on ethylene oxide and propylene oxide units of the formula



wherein R_3 is alkyl or alkenyl each of 8 to 16 carbon atoms, one of Z_1 and Z_2 is hydrogen and the other is methyl, y is 3 to 50, n_1 is 1 or greater, n_2 is zero or greater and the sum n_1+n_2 is 3 to 15,

and subsequently subjecting the textile material to a heat treatment.

4,408,996

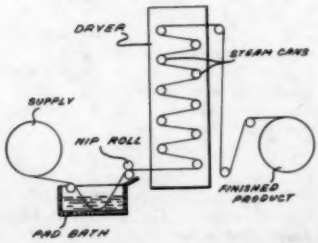
PROCESS FOR DYEING ABSORBENT MICROBIOCIDAL FABRIC AND PRODUCT SO PRODUCED

A. Frank Baldwin, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 9, 1981, Ser. No. 310,416

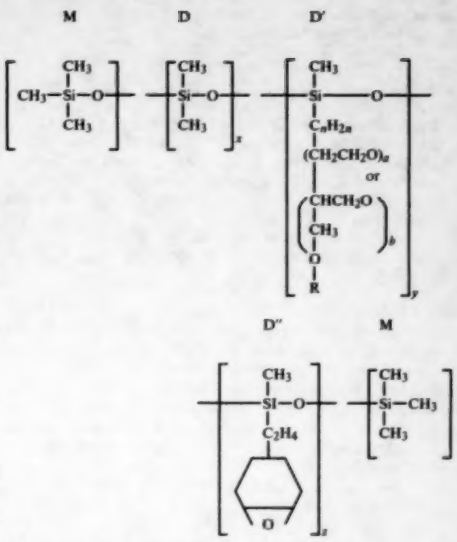
Int. Cl.[3] D06P *5/02;* A01N *1/02;* B05D *3/02;* A61F *13/00*

U.S. Cl. 8—490 6 Claims

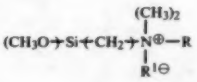


1. A process for making a dyed, absorbent, bioactive wettable medical fabric comprising the steps of:

(a) mixing (1) a wettable hydrophilic coupling amount of an organosilicone terpolymer of the formula:



wherein R is hydrogen or methyl, the sum of a+b is in the range of 5 to 200, x is 10 to 50,000, y is 1 to x and z is 1 to 0.5x provided that the sum of y+z is ≦0.75x with (2) a tinctorial amount of a compatible direct dye, and (3) bioactive amount of a bioactive silyl quaternary amine compounds have the formula:



wherein R is an alkyl of 11 to 22 carbon atoms and R^1 is a bromine or chlorine; and

(b) applying the mixture of step (a) to a non-woven cellulose-containing substrate; and

(c) heating the thus coated substrate from step (b) to dry the substrate and fix the dye, microbiocide and hydrophilic coupling agent to said substrate, thereby producing a dyed, bacteriocidal substantially non-leachable and non-flammable finish which is substantive on said substrate.

4,408,997

PROCESS FOR DYEING COTTON WITH REACTIVE DYES IN WEAKLY ALKALINE DYE-BATH(PH 8.0–8.8)

Max Perrig, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Oct. 28, 1981, Ser. No. 316,704

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040832; Oct. 30, 1980, 3040833

Int. Cl.[3] D06P *1/67, 3/66*

U.S. Cl. 8—532 19 Claims

1. A process for dyeing a substrate comprising or consisting of cotton fibers which comprises treating the substrate at a temperature of 60° to 80° C. in a dyebath having a pH of 8.0 to 8.8 and containing a reactive dye having a fluorochloropyrimidine, monofluorotriazine, dichlorotriazine, dichloroquinoxaline or methylsulphochloromethylpyrimidine reactive group, 20 to 60 g/l salt and, as the sole alkaline agent, 0.2 to 1 g/l calcined sodium carbonate or the equivalent amount of hydrated sodium carbonate, the total amount of the reactive dye

to be applied to the substrate being present in the dyebath at the commencement of the treatment of the substrate in the dyebath at 60° to 80° C.

4,408,998

PROCESS FOR PREPARING THERMALLY STABLE AMMONIUM NITRATE- CONTAINING GRANULES

Stanislaus M. P. Mutsers, Geleen; Cornelis Hoek, Nieuwstadt, and Gerardus M. C. Wagemans, Haelen, all of Netherlands, assignors to Unie Van Kunstmestfabrieken BV, Utrecht, Netherlands

Filed Jun. 18, 1982, Ser. No. 390,136

Claims priority, application Netherlands, Jun. 19, 1981, 8102959

Int. Cl.³ C06B *1/04*

U.S. Cl. 23—293 A **11 Claims**

1. A process for preparing thermally stable ammonium nitrate-containing granules of high bulk density, high impact resistance, high crushing resistance and little or no tendency to cake from a composition containing a stabilization agent and ammonium nitrate comprising the combination of steps of:

(a) forming a fluidized bed of ammonium nitrate containing seed particles at a bed temperature of between about 95° C. to about 145° C.;

(b) spraying a melt composition composed of ammonium nitrate and containing:

(i) at most about 5% by weight water; and

(ii) about 0.5% to about 5% by weight of a finely divided silica-containing material which is insoluble in and chemically insert to ammonium nitrate

into said seed bed thereby forming ammonium nitrate-containing granules; and

(c) discharging said granules from said bed and recovering said granules, said recovery including the rapid cooling of said granules.

4,408,999

COAL AND OIL SHALE BENEFICIATION PROCESS

Ramachandra A. Nadkarni, and Rollie B. Williams, both of Baytown, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 11, 1981, Ser. No. 262,146

Int. Cl.³ C10L *9/02*; C10G *1/04*

U.S. Cl. 44—1 SR **11 Claims**

1. A process for the beneficiation of carbonaceous solids containing inorganic, ash-forming constituents including silica, alumina and metal-containing compounds which comprises:

(a) mixing said carbonaceous solids with an aqueous inorganic acid to form a slurry;

(b) treating said slurry with electromagnetic radiation having a frequency between about 0.10 MHz and about 10^5 MHz in a treatment zone, whereby said inorganic, ash-forming constituents including silica, alumina and metal-containing compounds reacting with said inorganic acid to form soluble compounds which dissolve in the aqueous portion of said slurry and wherein the power of said electromagnetic radiation is such that no arcing occurs in said treatment zone and substantially none of the carbonaceous material in said carbonaceous solids is destroyed; and

(c) recovering beneficiated carbonaceous solids depleted in said ash-forming constituents including silica, alumina and metal-containing compounds from said treatment zone.

2. A process as defined by claim 1 wherein said carbonaceous solids comprise coal.

3. A process as defined by claim 1 wherein said carbonaceous solids comprise oil shale.

4. A process as defined by claim 1 wherein said carbonaceous solids comprise liquefaction bottoms.

4,409,000

COMBINATIONS OF HYDROXY AMINES AND CARBOXYLIC DISPERSANTS AS FUEL ADDITIVES

William M. LeSuer, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

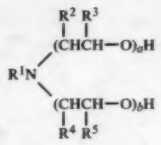
Filed Dec. 14, 1981, Ser. No. 330,549

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—70 **17 Claims**

1. A composition comprising:

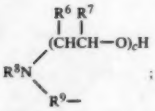
(A) at least one hydroxy amine of the formula



(I)

wherein:

R^1 is an alkyl or alkenyl radical containing from about 8 to about 30 carbon atoms or a radical of the formula



(II)

each of R^2, R^3, R^4, R^5, R^6 and R^7 is hydrogen or a lower alkyl radical;

R^8 is an alkyl or alkenyl radical containing from about 8 to about 30 carbon atoms;

R^9 is an alkylene radical containing from 2 to about 6 carbon atoms; and

each of a, b and c is an integer from 1 to about 75; and

(B) at least one hydrocarbon-soluble carboxylic dispersant characterized by the presence within its molecular structure of:

a substantially saturated hydrocarbon-based radical containing at least about 30 aliphatic carbon atoms, attached to

at least one acyl, acyloxy or acylimidoyl radical, which is also attached through nitrogen to

a polar group.

4,409,001

GASOLINE COMPOSITIONS CONTAINING AMINO ALKANOIC ACIDS AS DETERGENTS

Rodney L. Sung, Fishkill; William M. Sweeney, Wappingers Falls, both of N.Y., and Wheeler C. Crawford, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,197

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—71 **12 Claims**

1. A motor fuel composition comprising

(a) a major portion of fuel containing a hydrocarbon boiling in the gasoline boiling range; and

(b) a minor effective amount of, as detergent additive, an (alkyl polyoxyalkyl) amino alkanoic acid.

4,409,002

UTILITY TORCH HAVING HEAD MIXER

Roger D. Zwicker, Arlington, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Apr. 29, 1982, Ser. No. 373,043

Int. Cl.³ B01F *5/00*

U.S. Cl. 48—180 F **6 Claims**

1. In a torch assembly that includes:

a. a cutting oxygen valve and passageway;

b. a preheat oxygen valve and passageway;
c. a fuel gas valve and passageway; and
d. a head having a tip end for having a tip affixed thereto and having a head passageway for cutting oxygen and a head passageway for mixture of fuel and oxygen;

the improvement comprising:

e. an integral head mixer having within the head an incoming preheat oxygen passageway and an incoming fuel passageway, a mixer insert disposed within said incoming fuel passageway and having engaging seal means for constraining said fuel to flow through said insert; said insert having a centrally disposed bore communicating at its inlet end with said incoming fuel passageway and terminating at its discharge end in a plurality of at least three apertured passageways that extend radially outwardly at respective acute angles with respectively longitudinal axis of the

bore; said apertured passageways terminating downstream of the seal means so as to direct the fuel gas into a surrounding annular space defined by the insert discharge end and the surrounding incoming fuel passageway, and with a connecting conduit between said preheat oxygen passageway and said incoming fuel passageway annular space for having oxygen flowed therethrough for intimate admixing between the fuel and oxygen; said surrounding annular space having an annular area between said insert and the wall of said head passageway through said mixture at the plane of the apertured passageways that is about the same as the total area of the apertured passageways;

whereby said fuel is intimately admixed with said preheat oxygen in a short interval within said head, obviating disastrous and damaging flashbacks.

4,409,003

CARBONITRIDE COATED SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington, and Sergej-Tomislav Buljan, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,381
Int. Cl.³ B24D *11/00*
U.S. Cl. 51—295 **14 Claims**

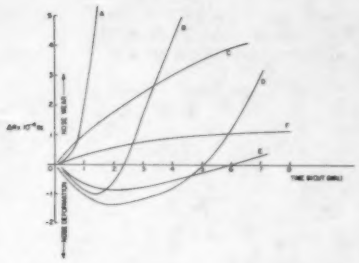
1. A coated ceramic cutting tool comprising a densified silicon nitride substrate body having at least one adherent coating layer; said substrate body consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a densification aid selected from the group consisting of silicon dioxide, aluminum oxide, magnesium oxide, yttrium oxide, hafnium oxide, zirconium oxide, the lanthanide rare earth oxides, and mixtures thereof; said adherent coating layer consisting essentially of a material selected from the refractory metal carbonitrides.

4,409,004

CARBONITRIDE COATED COMPOSITE SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington; Sergej-Tomislav Buljan, Acton, and Charles D'Angelo, Southboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,382
Int. Cl.³ B24D *11/00*
U.S. Cl. 51—295 **16 Claims**



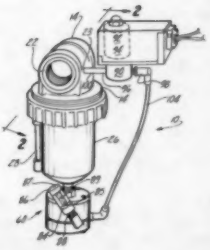
1. A coated composite ceramic cutting tool comprising a composite silicon nitride substrate body having at least one adherent coating layer; said substrate body consisting essentially of particles of a refractory material uniformly distributed in a matrix consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a densification aid selected from the group consisting of yttrium oxide, hafnium oxide, the lanthanide rare earth oxides, and mixtures thereof; said adherent coating layer consisting essentially of a material selected from the refractory metal carbonitrides.

4,409,005

METHOD AND APPARATUS FOR SEPARATING LIQUID AND SOLID CONTAMINANTS FROM A FLOWING GAS

Lorne J. McKendrick, 7724 Merriman Rd., Westland, Mich. 48185

Filed Jul. 6, 1981, Ser. No. 280,880
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—1 **7 Claims**



1. A device for separating solid particulate material and entrained liquid from an airstream comprising:

a housing defining an interior chamber having a bottom portion, said housing having an inlet and an outlet open to said chamber,

means contained within said housing chamber for separating solid particulate matter and entrained liquid from said airstream so that said separated solid particulate matter and said liquid collect in said bottom portion of said chamber,

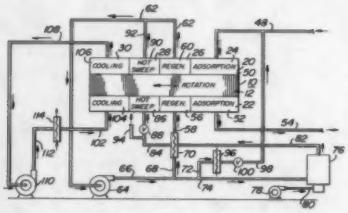
means for periodically purging liquid and solid particulate matter from the bottom portion of said chamber comprising a normally closed dump valve fluidly connected to said bottom portion of said chamber, means for moving said dump valve to an open position comprising an electrically operated valve having an inlet duct fluidly connected to said chamber and an outlet duct fluidly connected to said dump valve and timer means for periodically actuating said electrically operated valve.

4,409,006

REMOVAL AND CONCENTRATION OF ORGANIC VAPORS FROM GAS STREAMS

Manlio M. Mattia, 1208 Waterford Rd., West Chester, Pa. 19380

Filed Dec. 7, 1981, Ser. No. 328,033
Int. Cl.³ B01D *53/08*
U.S. Cl. 55—28 **10 Claims**



1. A process for the removal and concentration of organic vapor from gas streams comprising continuously and simultaneously conducting various steps on different sections both above and below a rotating bed of adsorbent material and sequentially rotating the bed through the steps of:

(a) passing organic vapor-laden gas in a direction normal to said bed through a first section for adsorption of organic vapors and to produce a gas stream having a reduced quantity of organic vapor;

(b) passing a hot, partially inert regenerating gas in a direction normal to said bed through a second section to substantially regenerate said adsorbent material and to provide a partially inert gas stream rich in organic vapor, a portion of which forms a product stream; and

(c) passing a hot inert gas, substantially free of organic vapor, in a direction countercurrent to the flow of said organic vapor-laden gas and normal to said bed through a third section to provide more complete regeneration of said adsorbent material.

4,409,007

PRECIPITATOR RAPPER

Rodney J. Torrey, Erie, Pa.; Dennis Astemborski, Tucson, Ariz.; Marshall A. Carner, Fairview, and Gerald D. Rose, Erie, both of Pa., assignors to Eriez Manufacturing Company, Erie, Pa.

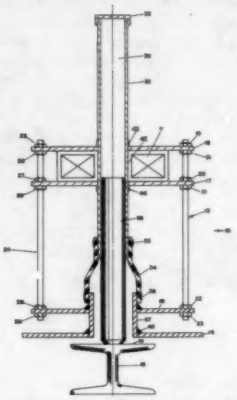
Filed Oct. 19, 1981, Ser. No. 312,909
Int. Cl.³ B03C *3/76*
U.S. Cl. 55—112 **9 Claims**

1. In combination, an electrostatic precipitator having a precipitator frame and a rapper to impact said precipitator frame, said rapper comprising a rapper frame and a first support means for supporting said rapper frame on a top wall of said precipitator,

said rapper frame comprising vertically spaced plates having openings therein and means supporting said plates in vertically spaced relation,

a first solenoid having an opening therein, said solenoid being supported by and sandwiched between said plates with said solenoid opening being in alignment with said openings in said plates, a vertically disposed non-magnetic tube extending through said opening in said solenoid and through said openings in said plates, means for holding said plates in position on said tube,

a hammer reciprocably received in said tube, an opening in said top wall of said precipitator and aligned with said opening in said solenoid and said openings in said plates so as to enable said hammer to impact said frame of said



precipitator, a cap on the upper end of said tube providing access to the upper end of said hammer inside said tube whereby the position of said hammer relative to said tube can be determined,

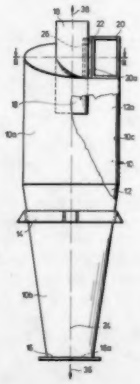
said means for holding said plates in position comprising upper and lower clamps on said tube whereby said tube can be slid up or down relative to said solenoid.

4,409,008

DUST DISPOSAL CYCLONES

Laszlo Solymes, Budapest, Hungary, assignor to Malom-Es Sutoipari Kutatointezet, Budapest, Hungary

Filed Mar. 25, 1981, Ser. No. 247,318
Claims priority, application Hungary, May 29, 1980, 1346/80
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—261 **2 Claims**



1. In a dust disposal cyclone of circular cross-sectional configuration having a tangential inlet for dust-laden air and an axial outlet for dust-freed air, said outlet protruding into the cyclone; the improvement in which the inlet has a flank facing but spaced from the outlet by a gap defined by and between said flank and said outlet and communicating between the

ambient air and the interior of the cyclone, through which gap ambient air is inducted by the dust-laden air that enters through the inlet, and an arcuate baffle between the inducted air and the dust-laden air in the inlet, the baffle being arcuate in the same direction as the outer wall of the cyclone to deflect the inducted air into the same direction in which the dust-laden air from the inlet rotates in the cyclone.

4,409,009

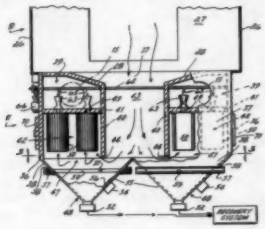
POWDER SPRAY BOOTH

Gunter J. Lissy, Amherst, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 962,507, Nov. 20, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 214,192

Int. Cl.[3] B01D *46/36*

U.S. Cl. 55—302 4 Claims



1. A powder spray booth and powder recovery/static cartridge filter unit configuration comprising:

booth means providing a controlled area in which to powder coat substrates, defined generally by a ceiling, side and end walls, and a floor;

a powder collection chamber in close proximity to the booth;

means for removing collected powder from the bottom of said powder collection chamber,

a clean air chamber sealed from the booth and from the powder collection chamber, said clean air chamber being provided with a multiplicity of individual openings from the powder collection chamber into said clean air chamber;

static filter means located within said powder collection chamber and operative to effectively prevent powder from entering said clean air chamber, said static filter means comprising a plurality of static filter cartridges,

blower means operative to create a negative pressure in said clean air chamber;

means for cleaning powder from the surface of said filter cartridges by periodically and sequentially reversing air flow through selected filter cartridges while maintaining air flow from said powder collection chamber to said clean air chamber through the other of said filter cartridges so that there is no net interruption of the air flow from the powder collection chamber into the clean air chamber during the cleaning of said selected filter cartridges;

means for preventing a fire within said powder collection chamber from causing an explosion, said explosion prevention means including a substantially unrestricted flow path leading directly from said powder collection chamber into said booth operative to effectively vent any fire created pressure build-up within said powder collection chamber into said booth without the occurrence of an explosion;

means for periodically imparting vibrations to said walls of said powder collection chamber; and

vibration dampening means for isolating said booth and said clean air chamber from vibrations imparted to said powder collection chamber.

4,409,010

METHOD AND APPARATUS FOR GLASS MOULD LUBRICATION

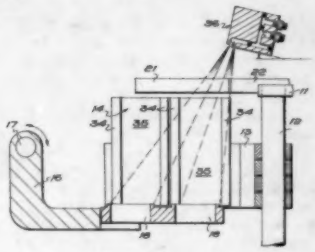
Roy Brown, Dronfield, England, assignor to Graphoidal Developments Limited, England

Filed Jun. 26, 1981, Ser. No. 277,898

Claims priority, application United Kingdom, Jun. 26, 1980, 8020909; Apr. 23, 1981, 8112593

Int. Cl.[3] C03B *39/00*

U.S. Cl. 65—26 9 Claims



1. A method of intermittently spraying lubricant onto at least one mould of a hollow glassware moulding machine, which mould has a pair of openable halves defining one or more cavities with upright axes extending between first and second ends of the cavities, comprising arranging spray discharge points beyond one of said ends and fixed relative to the open positions of the mould halves, the lubricant being a liquid and being sprayed as droplets entrained in a steam of air or other gas, separately delivering the lubricant and gas to and mixing the lubricant and gas in spray heads which define the discharge points, periodically discharging a quantity of the lubricant generally along the respective axis from said points onto the mould halves while the mould halves are in their open position, continuing the discharge of air after the discharge of liquid lubricant.

4,409,011

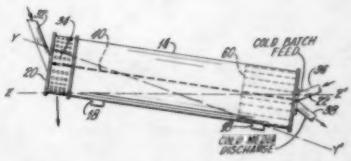
PREHEATING GLASS BATCH

Charles M. Hohman, Granville; Mark A. Propster, Gahanna, and Stephen Seng, Bladensburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 181,589, Aug. 27, 1980, Pat. No. 4,319,903. This application Dec. 14, 1981, Ser. No. 330,063

Int. Cl.[3] C03B *1/00*

U.S. Cl. 65—27 3 Claims



1. A process for producing glass by charging to a melting furnace and melting therein a particulate glass batch, including the steps of:

heating durable heat transfer media, larger in particle size than the glass batch, with exhaust gases from the melting furnace;

introducing the hot media into one end of an inclined container rotatable about an axis having the same inclination as the container;

introducing the particulate glass batch into the other end of the container with the media charging end of the container elevated above the batch charging end;

rotating the container, during rotation the batch and media tumbling and moving over each other in heat transfer relationship;

moving the glass batch in one direction through the rotating container towards the upper end for discharge and moving the hot media in the opposite direction for discharge at the lower end wherein the batch in the container generally flows in a downhill direction towards the upper end for discharge; and

discharging cold media at the lower end of the container through means that allows the media to pass freely through but that prevents the batch from passing.

3. An apparatus for preheating particulate glass batch comprising:

means for heating durable heat transfer media with exhaust gases from a melting furnace;

a container rotatable about an axis, the axis being inclined to the horiziontal;

means for introducing the hot media, larger in particle size than the glass batch, into the elevated end of the container for movement towards the lower end for discharge;

means for introducing particulate glass batch into the lower end of the container for movement towards the elevated end for discharge;

means for rotating the container along the inclined axis;

means associated with the interior of the container for tumbling and moving the particulate glass batch in direct contact with hot media during rotation of the container to heat the glass batch prior to charging to a melting furnace;

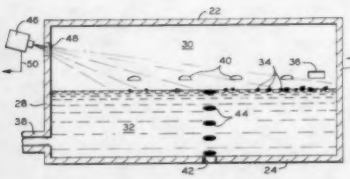
means for discharging cold media at the lower end of the container that allows the media to pass freely through but that prevents the batch from passing through; and

means for discharging hot batch at the upper end of the container wherein an axis drawn from the means for introducing batch to the means for discharging batch extends in a downhill direction towards the means for discharging batch.

4,409,012
METHOD AND APPARATUS FOR MONITORING A GLASS FURNACE

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 16, 1982, Ser. No. 349,133
Int. Cl.³ C03B 1/00
U.S. Cl. 65—29 **25 Claims**



1. A method of estimating the relative amounts of two materials in a region of the surface of a mixture containing at least the two materials from a digitized video pixel signal representative of the amount of light received from the region of the surface of the mixture, one material being brighter in light intensity than the other material, comprising the steps of:

(a) selecting the video pixel signals from a predetermined area of the surface of the mixture;

(b) generating a histogram based on the total number of said selected pixel signals of equal intensity as a function of a relative light intensity scale; and

(c) determining the areas defined by said generated histogram for each of the materials, the relative amounts of said determined areas being approximately equal to the amounts of the materials in the predetermined area of the surface of the mixture.

19. In an enclosure containing a mixture of two materials, one material appearing to be brighter in light intensity than the other darker material, an apparatus for determining the relative amounts of the materials in a region of the surface of the mixture including means for generating a plurality of digital pixel signals representative of light from points in the region of the surface of the mixture, comprising:

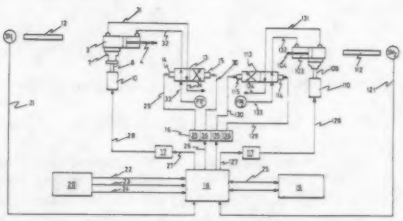
means responsive to the pixel signals for generating output signals representing a histogram based on the total number of the pixel signals of equal intensity as a function of a relative light intensity scale; and

means responsive to said output signals for determining the amount of area defined by the histogram for each of the materials, the amounts of the areas being proportional to the amounts of the associated materials in the region of the surface of the mixture.

4,409,013
90 DEGREE PUSH-OUT FOR GLASSWARE FORMING MACHINES AND ELECTRONIC CONTROL FOR THE SAME

Luis F. Cardenas, and Enrique M. Veazey, both of Monterrey, Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Oct. 26, 1981, Ser. No. 314,796
Claims priority, application Mexico, Oct. 27, 1980, 184491
Int. Cl.³ C03B 9/40
U.S. Cl. 65—163 **4 Claims**



1. In an electronic control system for an article transfer apparatus for transferring glassware articles from a dead plate of a glassware forming machine to a take-off conveyor and comprising a fluid actuating cylinder and piston assembly mounted for rotation on a vertical shaft between a first position on the dead plate and a second position on the take-off conveyor, ware engaging members mounted on said piston, means for actuating said cylinder and piston assembly between a retracted and an extended position, a stepping motor for rotating said vertical shaft, and control means for sequentially operating said cylinder and piston actuating means and said stepping motor for first extending said ware engaging members to engage ware resting on said dead plate, rotate said extended ware engaging members to deposit the ware on said take-off conveyor with a velocity component and a direction component substantially equal to the velocity and direction of the conveyor, retracting the ware engaging members, and rotating the retracted ware engaging members back to their original position on the dead plate:

means for adjusting the speed of said take-off conveyor as a function of the number of glassware articles handled by the glassware forming machine and of the desired spacing between articles on said conveyor and

a real time clock for controlling the movement of said ware engaging members and said take-off conveyor as a function of the time between glass gobs fed to the glassware forming machines and

a glass gob cut sensor for producing a timing signal to be fed to said real time clock and

means for calculating the velocity profiles of said ware engaging members and said take-off conveyor as a function of the operator-input information about the desired spacing of the glassware articles on said take-off conveyor.

4,409,014

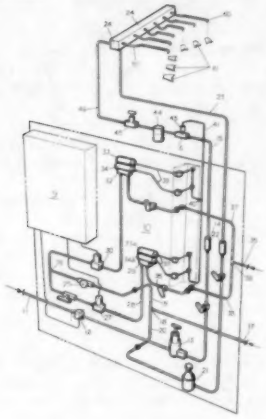
CONSTANT OIL TO WATER RATIO SHEAR SPRAY SYSTEM

Randle W. Taylor, Sylvania, and Richard G. Davey, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 25, 1981, Ser. No. 324,904

Int. Cl.³ C03B *7/10*

U.S. Cl. 65—170 **11 Claims**



1. In apparatus for spraying an oil-water mixture onto a plurality of individual shear blades of a glass gob feeder wherein water, air and oil supply lines are provided, with the water and air lines being connected to a distributing and mixing block, the improvement comprising a flow meter in said water line, an oil-water ratio controller, an oil injector connected to the water line in advance of the mixing block for injecting oil into the water, means connecting the output of said flow meter to said ratio controller for actuating the oil injector in response to the quantity of water, a plurality of individual chambers in said mixing block each receiving a metered quantity of the oil-water mixture entrained in air, in individual spray nozzle for each shear blade, and means connecting an individual chamber to a spray nozzle whereby uniform oil-water mixtures are provided for each of the plurality of shear blades.

4,409,015

FLOWABLE LIQUID FERTILIZER CONTAINING SUSPENDED WATER INSOLUBLE NITROGEN

Thomas T. Grace, Jr., Lanesville, Ind., assignor to Borden, Inc., Columbus, Ohio

Filed Feb. 11, 1982, Ser. No. 348,040

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **32 Claims**

1. A two stage process for preparing an aqueous dispersion of a urea-formaldehyde condensation product comprising:

in a first stage, reacting together formaldehyde and urea in a molar ratio of formaldehyde to urea in the ratio from about 2.5 to 1 to about 4.7 to 1 in the presence of a condensation catalyst until the methanol tolerance is in the range from about 150% to about 800%, to form an intermediate reaction product, then

in a second stage, reacting said intermediate reaction product with an additional amount of urea such that the overall molar ratio of urea to formaldehyde is in the range from 0.8 to 1 to about 1.7 to 1, at an acid pH and at an elevated temperature not above about 70° C., until the amount of water insoluble nitrogen present in the reaction mixture is in the range from about 15% to about 35% based on the total amount of nitrogen in the system.

30. An aqueous dispersion of a urea-formaldehyde condensation product having a molar ratio of urea to formaldehyde in the range from about 0.8 to 1 to about 1.7 to 1, in which at least 50% of the formaldehyde content of the product is supplied by a condensation product of urea and formaldehyde having a methanol tolerance in the range from about 150% to about 800%, and such that the condensation product is clear and will remain clear and substantially free from precipitated reaction material, upon storage for one year at room temperature, said dispersion being further characterized by having a viscosity in the range from about 150 cps to about 300 cps, as measured on a Brookfield Viscometer Model LVF, spindle **2**, at 30 rpm and 25° C., which viscosity is stable at a temperature in the range from about 50° F. to 90° F. (10° C. to 32° C.) for at least four months when the nitrogen content of the product is in the range from about 17% to about 19% and at least two months when the total nitrogen content of the product is in the range from about 19% to about 25% by weight based on total product.

4,409,016

PROCESS FOR PREPARING THERMALLY STABLE AMMONIUM NITRATE-CONTAINING GRANULES OF HIGH BULK DENSITY

Stanislaus M. P. Mutsers, Geleen; Cornelis Hoek, Nieuwstadt, and Gerardus M. C. Wagemans, Haelen, all of Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Filed Jun. 18, 1982, Ser. No. 390,137

Claims priority, application Netherlands, Jun. 19, 1981, 8102958

Int. Cl.³ C05C *1/00;* **C01C** *1/18;* **C01B** *21/48;* **A01N** *25/00*

U.S. Cl. 71—59 **12 Claims**

1. A process for preparing thermally stable ammonium nitrate-containing granules of high bulk density from a composition containing a stabilization agent and ammonium nitrate, comprising the combination of steps of:

(a) forming a fluidized bed of ammonium nitrate seeds kept separated from each other while being contacted by and suspended within a gas current, said fluidized bed being fluidized with air flowing through said bed from bottom to top at a superficial velocity about twice the minimum fluidizaton velocity;

(b) spraying a liquid composition composed of ammonium nitrate and containing:

(i) at most about 15% by weight water,

(ii) about 0.3% to about 3.5% by weight calcium nitrate, and

(iii) about 0.5% to about 5.0% by weight of a thermal stabilization agent wherein said stabilization agent is a finely divided silica-containing material which is insoluble in and chemically inert to ammonium nitrate

into said seed bed while said bed is maintained at a temperature of between about 95° C. to about 145° C. whereby granules are thereby formed and then discharged from said seed bed; and

(c) recovering and rapidly cooling the thus formed granules discharged from said seed bed.

4,409,017

HERBICIDAL ISOQUINOLINOXY- OR ISOQUINOLINAMINO-PHENOXY ALKANE CARBOXYLIC ACID DERIVATIVES

Alexander Serban, Doncaster; Graham J. Bird, North Melbourne, and Lindsay E. Cross, Maribyrnong, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

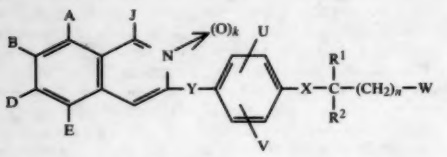
Filed Jun. 16, 1981, Ser. No. 274,164

Claims priority, application Australia, Jul. 1, 1980, PE4317; Dec. 22, 1980, PE7035

Int. Cl.[3] **A01N** *43/42;* **C07D** *217/22, 217/24*

U.S. Cl. 71—94 **8 Claims**

1. A compound of the formula



wherein:

A, D, E, U, V and R^2 are hydrogen;

B is halogen;

J is halogen;

R^1 is methyl;

W is the group

wherein G is selected from the group consisting of hydroxy, C_1 to C_{10} alkoxy, C_2 to C_{10} alkenyloxy, C_2 to C_{10} alkynyloxy, and the group OM wherein M is an alkali metal or alkaline earth metal ion;

X is oxygen;

Y is selected from oxygen and the group NR^6 wherein R^6 is methyl; and

k and n are both 0.

6. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim **1**.

4,409,018

HEXAHYDROISOINDOL DERIVATIVES, AND THEIR PRODUCTION AND USE

Yasuo Ishida, Suita, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

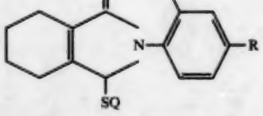
Filed May 28, 1981, Ser. No. 267,681

Claims priority, application Japan, May 30, 1980, 55-72949

Int. Cl.[3] **A01N** *43/38;* **C07D** *209/46*

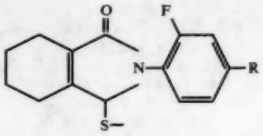
U.S. Cl. 71—96 **21 Claims**

1. A compound represented by the formula



wherein R is a halogen; Q is (1) hydrogen, (2) a straight-chain or branched (C_{1-11}) alkyl group which may be substituted by a hydroxyl group, a cyano group, a (C_{2-4}) alkanoyl group, a benzoyl group or a (C_{1-4}) alkoxycarbonyl group, (3) a benzyl group, (4) a (C_{2-6}) alkenyl group, (5) a phenyl group, (6) R_1S, (7) R_2CO, or (8)

wherein R^1 is selected from a straight-chain or branched (C_{1-11}) alkyl group, a phenyl group which may be substituted by a halogen, or



wherein

R is as defined above;

R_2 is selected from a straght-chain or branched (C_{1-11}) alkyl group which may be substituted by a (C_{1-4}) alkoxy group, or a phenyl group which may be substituted by a halogen or a (C_{1-4}) alkyl group;

R_3 is selected from a straight-chain or branched (C_{1-11}) alkyl group, a (C_{2-6}) alkenyl group, a cyclohexyl group, a benzyl group, or a phenyl group which may be substituted by a halogen or a (C_{1-4}) alkyl group;

X is selected from oxygen or an imino group which may be substituted by a (C_{1-4}) alkyl group; and

Y and Z are each selected from oxygen or sulfur.

15. A herbicidal composition comprising a herbicidally effective amount of the compound of claim **1**, in combination with an inert carrier.

4,409,019

METHOD FOR PRODUCING COBALT METAL POWDER

Clarence D. Vanderpool, and Martin B. MacInnis, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 10, 1982, Ser. No. 448,579

Int. Cl.[3] **C22B** *23/04*

U.S. Cl. 75—0.5 AA **7 Claims**

1. A method of producing cobalt metal powder from a source consisting essentially of cobalt comprising contacting said cobalt source with an aqueous solution of hydrogen iodide and iodine, said iodine being present at a desired concentration and in an amount sufficient to solubilize a portion of said cobalt source and form a solution containing cobalt values, reducing said cobalt values to produce a cobalt metal powder.

4,409,020

RECOVERY OF METALS FROM GRINDING SLUDGES

James L. Holman, Jr., and Leander A. Neumeier, both of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 24, 1983, Ser. No. 460,102

Int. Cl.[3] **C22C** *1/04;* **B02F** *9/04*

U.S. Cl. 75—0.5 B **4 Claims**

1. A process for recovery of metal values from magnet alloy grinding sludge comprising the sequential steps of:

(1) removing a major portion of sulfur and oil contaminants from the sludge by means of an organic solvent,

(2) drying the desulfurized and deoiled sludge at a temperature of about 90° to 105° C. for a period sufficient to remove substantially all remaining water and solvent, and obtain a dried product,

(3) grinding the dried product for a period sufficient to partially free grinding abrasive material,

(4) subjecting the ground product to sizing and magnetic separation to segregate a majority of the coarser abrasive material in a low-metallics nonmagnetic fraction,

(5) oxidation-roasting of the sludge at a temperature of about

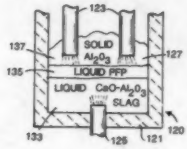
850° to 1,000° C. to selectively remove residual sulfur and carbon, and

(6) subjecting the oxidized sludge to a gaseous hydrogen reduction at a temperature of about 1,050° to 1,2000° C. to reoxidize and recover purified metal values.

4,409,021
SLAG DECARBONIZATION WITH A PHASE INVERSION

Thomas W. Moore, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 6, 1982, Ser. No. 375,492
Int. Cl.³ C22B *4/02, 21/02*
U.S. Cl. 75—10 R **14 Claims**



1. A batch method for decarbonizing primary furnace product from an aluminum carbide content of up to about 35% to a useful content of about 2% Al_4C_3 by maximizing mass transfer of said aluminum carbide between molten slag and molten primary furnace product in a decarbonization arc furnace which has elevatable electrodes and is operated in the extraction mode, comprising the operation of said decarbonization furnace according to the following steps:

A. providing a greatly increased interfacial area of alumina and said primary furnace product in the presence of a melting point depressant, said providing being accomplished by adding a charge of primary furnace product, as an aluminum/aluminum carbide alloy, and an alumina slag, containing said depressant, to said decarbonization arc furnace for forming a two-layered melt, as an underlying molten slag layer and an overlying layer of alloy melt having a top melt surface;

B. adding a stoichiometric amount of granular alumina to said furnace and onto said top melt surface to form an alumina cover layer, whereby said cover layer insulates said top melt surface from radiant heat and captures aluminum vapors and aluminum oxide vapors emanating therefrom;

C. mechanically agitating said cover layer with sufficient regularity to cause said granular alumina to remain in intimate contact with said top melt surface while continuously supplying electrical power to the electrodes for melting said alumina, whereby:

(1) the melted alumina sinks into said alloy melt and forms a two-phase liquid region within which extraction of aluminum carbide from said alloy takes place across a plurality of interfaces throughout said region, according to the extraction reaction: $Al_4C_3+4Al_2O_3 \rightarrow 3Al_4O_4C$, so that said top melt surface becomes an upper interface which rises within said furnace as said reaction proceeds; and

(2) the unreacted melted alumina and aluminum tetraoxycarbide from said reaction descend to said underlying molten slag layer so that the lower interface between said slag layer and said two-phase liquid region also rises as said reaction proceeds;

D. elevating said electrodes to maintain arcs between said electrodes and said upper interface while said upper interface rises, whereby electrical conditions remain constant within said furnace; and

E. when said alumina is completely melted and said liquid region and said slag layer have separated into purified aluminum floating on a terminal slag pool into which said slag layer and said Al_4O_4C and unreacted Al_2O_3 in said two-phase region have coalesced, employing the following steps:

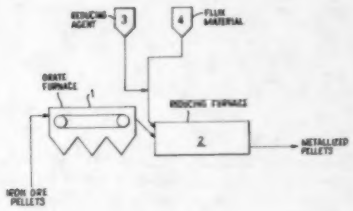
(1) decreasing power input to said electrodes in order to minimize vaporization from said purified aluminum and oxidation of aluminum along the upper surface thereof, and

(2) tapping said furnace and removing said purified aluminum therefrom.

4,409,022
METHOD OF PRODUCING LOW-SULFUR, REDUCED, IRON ORE PELLETS

Shinichi Kurozu, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Mar. 3, 1982, Ser. No. 354,337
Claims priority, application Japan, Mar. 9, 1981, 56-33616; Jun. 29, 1981, 56-100986
Int. Cl.³ C21B *13/08*
U.S. Cl. 75—36 **7 Claims**



1. A method of producing pellets of highly reduced iron oxide material, which pellets have a low sulfur content, which comprises: in a reducing furnace, heating a charge mixture of starting pellets of iron oxide material, a desulfurizing agent and a carbonaceous reducing agent of high sulfur content and low reactivity, to an elevated reduction temperature effective to generate a reducing atmosphere of carbon monoxide, and reacting said iron oxide material with said carbon monoxide to reduce said iron oxide material to metallic iron until the metallization of said iron oxide material has reached a value in the range of from 90 to 95 percent whereby to obtain pellets of highly reduced iron oxide; and thereafter maintaining said pellets of highly reduced iron oxide in said reducing furnace, at said reduction temperature and in contact with said reducing atmosphere of carbon monoxide, for at least fifteen minutes whereby to reduce the sulfur content of said pellets of highly reduced iron oxide.

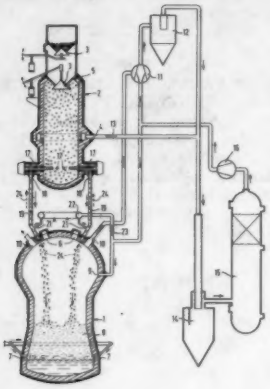
4,409,023
PROCESS FOR DIRECTLY MAKING LIQUID PIG-IRON FROM COARSE IRON ORE

Ralph Weber, Sao Paulo, Brazil; Bernt Rollinger, Baden-Baden, Fed. Rep. of Germany; Rolf Hauk, Baden-Baden, Fed. Rep. of Germany; Michael Nagl, Baden-Baden, Fed. Rep. of Germany, and Bernhard Rinner, Kehl am Rhein, Fed. Rep. of Germany, assignors to Korf-Stahl AG, Fed. Rep. of Germany and Voest-Alpine AG, Austria

Filed Sep. 10, 1981, Ser. No. 300,904
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034539
Int. Cl.³ C21B *13/14*
U.S. Cl. 75—38 **7 Claims**

1. Process for directly making liquid pig-iron from coarse iron ore, in which the ore is charged as loose bulk material into a direct-reduction shaft and there reduced to sponge-iron by the action of a hot reducing gas, after which the hot sponge-iron is transferred by a discharging device directly through at

least one communicating passage into a smelter-gasifier which produces, from coal and a blown-in oxygen-bearing gas, both the heat necessary for melting the sponge-iron and the reduction gas, of which a first part-stream, after cooling to the temperature specified for the reduction of the ore, and after removal of dust, is blown into the reduction zone of the reduction shaft, characterized in that a second part-stream (**24**) of



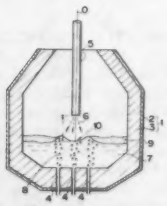
reduction gas flowing counter-current to the sponge-iron particles is cooled down to a temperature below 950° C. and passed through said communicating passage (**19**) from the smelter-gasifier to the direct reduction shaft (**2**), the flow-resistance in the path of the second part-stream being adjusted such that the volumetric flow-rate of the second part-stream (**24**) is 5 to 30 percent of the total flow of reduction gas entering the direct reduction shaft (**2**).

4,409,024

TOP-AND-BOTTOM BLOWN CONVERTER STEEL MAKING PROCESS

Yoshiei Kato; Tsutomu Nozaki, and Kyoji Nakanishi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP81/00239, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/01012, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 19, 1981, Ser. No. 385,407
Claims priority, application Japan, Sep. 19, 1980, 55-131402
Int. Cl.³ C21C *5/32, 5/34*
U.S. Cl. 75—60 **8 Claims**



1. A top and bottom blown converter steel making process comprising:

blowing an oxidizing gas onto the surface of molten iron in the converter through a lance aligned with the central vetical axis of the converter and disposed above the molten iron surface a distance L and having lance discharge holes with the hole axes at an angle θ_1 to said central vertical axis and each discharge hole having an angle of dispersion θ_2 for bringing the oxidizing gas into direct contact with the molten iron to form a hot spot having a horizontal distance Y between the central vertical axis of the converter and the outermost boundary of the hot spot according to the following formula:

$$Y = L \tan (\theta_1 + \theta_2/2)$$

and

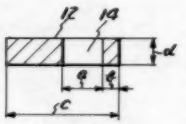
blowing gas into the molten iron through a plurality of tuyeres arranged in the bottom of the converter with the maximum distance X_0 among the distances X between the respective tuyeres and the center of the bottom of the converter being no greater than 1.3 times the distance Y.

4,409,025

HEAT RESISTANT CAST IRON-NICKEL-CHROMIUM ALLOY

Junichi Sugitani, Hirakata; Teruo Yoshimoto, Suita, and Makoto Takahashi, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Dec. 22, 1981, Ser. No. 333,470
Claims priority, application Japan, Jan. 12, 1981, 56-3605
Int. Cl.³ C22C *30/00*
U.S. Cl. 420—584 **2 Claims**



1. A heat resistant cast iron-nickel-chromium alloy consisting essentially of the following components in the following proportions in terms of % by weight:

C—0.3–0.6,
O<Si≦2.0,
O<Mn≦2.0,
Cr—20–30,
Ni—30–40,
W—0.5–5.0,
N—0.04–0.15,
B—0.0002–0.004,
Ti—0.04–0.50 and
Al—0.02–0.50,

the balance being substantially Fe.

4,409,026

SPRING STEEL FOR VEHICLES

Yoshiro Yamada, Akashi; Nobuyasu Hatsuoka, Itami, and Shinzo Ashida, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 17, 1981, Ser. No. 274,414
Claims priority, application Japan, Jun. 26, 1980, 55-86955
Int. Cl.³ C22C *38/24, 38/34*
U.S. Cl. 75—124 **6 Claims**

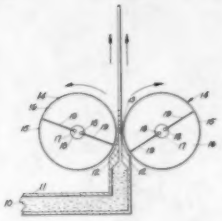
1. A suspension spring steel substantially composed of 0.5–0.7 wt% of C, 1.0–1.8 wt% of Si, 0.1–1.0 wt% of Mn, 0.3–0.55 wt% of Cr, 0.03–0.5 wt% of V, 0.02 to 0.1 wt% of Al and the balance of Fe and normally present impurities.

4,409,027

ALLOY STEEL FOR ROLL CASTER SHELL

James N. Cordea, Monroe, Ohio, and Harshad V. Sheth, Rancho Palos Verdes, Calif., assignors to Armco Inc., Middletown, Ohio

Filed Jun. 28, 1982, Ser. No. 393,192
Int. Cl.³ C22C 38/44
U.S. Cl. 75—128 W 9 Claims



1. A ferritic alloy steel consisting essentially of, in weight percent, from about 0.53% to about 0.58% carbon, about 0.40% to about 1.0% manganese, 0.10% to about 0.20% silicon, about 0.02% maximum phosphorus, about 0.02% maximum sulfur, about 0.45% to about 0.55% nickel, 1.50% to 3.00% chromium, 0.80% to 1.20% molybdenum, 0.30% to 0.50% vanadium, and balance essentially iron.

4,409,028

PROCESS FOR PRODUCING CAST IRON

William H. Moore, Whitehall Apts.-6E, Whitehall Rd., Chattanooga, Tenn. 37405

Continuation of Ser. No. 88,049, Oct. 24, 1979, abandoned. This application Oct. 23, 1980, Ser. No. 199,959
Int. Cl.³ C22C 33/08
U.S. Cl. 75—130 R 11 Claims

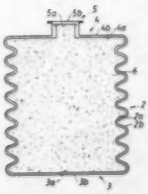
1. A method for controlling the graphite content in an iron melt comprising the steps of adding magnesium to the melt until more than 0.020% by weight of the melt is retained magnesium, bubbling the melt with carbon dioxide until the percentage of retained magnesium in the melt is around 0.005% by weight and then adding a nodularizer to the melt.

4,409,029

CONTAINER FOR ENCLOSING RADIOACTIVE WASTE AND A METHOD FOR TREATING WASTE ENCLOSED IN THE CONTAINER

Hans Larker, and Ragnar Tegman, both of Robertsfors, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Nov. 21, 1980, Ser. No. 209,196
Claims priority, application Sweden, May 19, 1980, 8003699
Int. Cl.³ B22F 31/14; B65D 89/04
U.S. Cl. 419—10 9 Claims



1. A method for converting radioactive particulate and piece-formed material into a solid body comprising enclosing the material in a gas-tight container having a cylindrical corrugated sheath; and consolidating and bonding the material by pressing the container under temperature and pressure conditions sufficient to cause bonding of the material, said consolidating and bonding step including the step of isostatically pressing the container and the material therein at an elevated temperature whereby to convert the enclosed material into a solid body.

4,409,030

MATERIAL FOR DESTROYING CONCRETE STRUCTURES

Keiichi Minegishi; Tokuji Akiba; Hiroshi Harada; Akihiko Takei, and Motoshi Abe, all of Kumagaya, Japan, assignors to Chichibu Cement Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1982, Ser. No. 346,120
Claims priority, application Japan, Feb. 6, 1981, 56-15730
Int. Cl.³ C04B 31/02, 7/35
U.S. Cl. 106—97 14 Claims

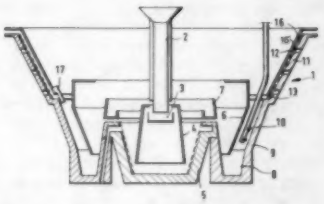
1. A destructive material comprising a mixture of 20 to 80 parts by weight of coarse-grained quicklime adjusted to a particle size of from 88 to 3000 microns by pulverizing a quicklime mass having a crystal size of 1–5 microns, said quicklime mass being obtained by calcination of limestone at a temperature of from 1200° to 1500° C., and 20 to 80 parts by weight of cement.

4,409,031

CONTINUOUSLY OPERABLE SUGAR CENTRIFUGAL AND METHOD FOR IMPROVING THE PURITY OF THE PRODUCED SUGAR

Helmut Schaper, Brunswick, Fed. Rep. of Germany, assignor to Braunschweigische Maschinenbauanstalt AG, Brunswick, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,680
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1981, 3106739
Int. Cl.³ C13F 1/06, 1/10
U.S. Cl. 127—19 6 Claims



1. A continuously operable sugar centrifugal having a rotational axis, comprising massecuite feeding means (2), massecuite distributing and accelerating means (4), a rotatably supported upwardly flaring frustum-shaped centrifugal basket including on its inside a separating screen (16'), said centrifugal basket further comprising a washing stage (9) in a narrow diameter basket area and a drying stage (11) in a larger diameter basket area, said massecuite feeding means being adapted for supplying massecuite into said centrifugal basket, stationarily arranged wash liquid supply nozzles (10) positioned for supplying washing liquid into said washing stage, separate receiving and discharging means for sugar and syrup respectively, said drying stage (11) forming, due to its larger diameter, a radially extending step which separates the drying stage (11) from said washing stage (9), closed surface cover means (12) arranged to cover the inside of said drying stage (11) and to rotate with said centrifugal basket, said closed surface cover means (12) being spaced from the separating screen (16') of the drying stage (11) to form a spacing (16), said closed surface cover means (12) having a shape substantially conforming to the shape of said centrifugal basket, said closed surface cover means (12) having a smaller diameter lower edge, said washing

stage (9) having an upper sugar overflow edge adjacent to said radially extending step, said edges forming a sugar slot (13) having a width which is narrower than that of any following sugar discharge opening within the centrifugal, for causing sugar crystals to move from said washing stage substantially radially relative to said rotational axis through said sugar slot (13) and into said spacing (16) for preventing any contaminated wash liquid and wash liquid spray from contacting sugar crystals after having passed through said sugar slot into said spacing (16), said centrifugal comprising further receiving and discharging means, said closed surface cover means (12) being in communication with said further receiving and discharging means for receiving and discharging wash water mist, condensate and sugar lumps into said further receiving means.

4,409,032

ORGANOSOLV DELIGNIFICATION AND SACCHARIFICATION PROCESS FOR LIGNOCELLULOSIC PLANT MATERIALS

Laszlo Paszner, Vancouver, and Pei-Ching Chang, Burnaby, both of Canada, assignors to Thermoform Bau-Und Forschungsgesellschaft, Murten, Switzerland

Continuation-in-part of Ser. No. 135,175, Mar. 28, 1980, abandoned, which is a continuation of Ser. No. 28,447, Apr. 9, 1979, abandoned, which is a continuation of Ser. No. 932,421, Aug. 11, 1978, abandoned. This application Mar. 26, 1981, Ser. No. 248,023

Claims priority, application Canada, Aug. 31, 1977, 285821

Int. Cl.³ C13K *1/02*

U.S. Cl. 127—37 **6 Claims**

1. In a process for the production of carbohydrate hydrolysates of cellulose from a cellulosic material which can contain lignin by treating the material in a pressure vessel with a solvent mixture with water containing a small quantity of a mineral acid selected from the group consisting of hydrochloric, sulfuric and phosphoric acids at an elevated temperature to solubilize the carbohydrate and until sugars are formed by hydrolysis from the solubilized carbohydrate in a liquor the improvement which comprises the steps of:

(a) supplying a solvent mixture containing acetone and water in a volume ratio of acetone to water between 70 to 30 and 60 to 40 and the acid in an amount of between 0.05 and 0.25 percent by weight of the mixture of hydrochloric acid or between 0.15 and 0.25 percent by weight of the mixture of phosphoric or sulfuric acids into the vessel under pressure with the cellulosic material to provide a limited retention time of the solvent mixture in the vessel of seven minutes or less such that sugars are not dehydrated or degraded into non sugars and then removing the solvent mixture as the liquor containing the sugars wherein the liquor removed from the vessel initially contains lignin and is separated from the liquor collected subsequently which contains the sugars;

(b) rapidly cooling the liquor immediately upon removal from the vessel to prevent degradation of the sugars to non sugars;

(c) recovering the sugars from the cooled liquor.

4,409,033

SIMULATED MOVING BED SEPARATION PROCESS FOR HIGH VISCOSITY FEED STREAMS

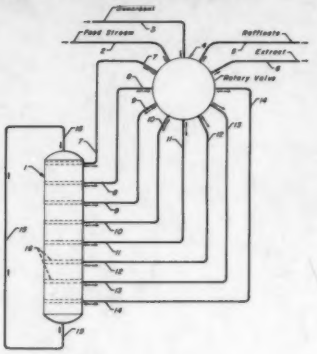
Charles F. LeRoy, San Antonio, Tex., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 18, 1981, Ser. No. 332,401

Int. Cl.³ C13D *3/14*

U.S. Cl. 127—46.2 **13 Claims**

1. In a process for the separation of monosaccharides wherein a feed stream containing a mixture of monosaccharides and a desorbent stream are separately passed into a fixed bed of solid adsorbent at various points through a plurality of conduits which are attached to a flow distribution means to simulate a moving bed of adsorbent, the improvement which comprises locating the fluid distribution means at an elevation



which is above the uppermost point at which one of the conduits communicates with the bed of adsorbent.

4,409,034

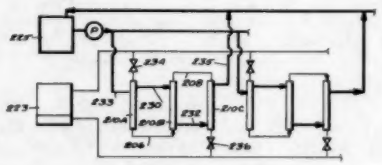
CRYOGENIC CLEANING PROCESS

Roger F. Williams, Louisville, Ky., assignor to Mobile Companies, Inc., Louisville, Ky.

Filed Nov. 24, 1981, Ser. No. 324,530

Int. Cl.³ B08B *7/04, 9/08*

U.S. Cl. 134—4 **11 Claims**



1. In a system for circulating heated fluid through at least first and last conduit channels which are juxtaposed with a container for viscous liquid which is in wetted contact with a wall of the container, a method of removing from said wall at least a major portion of such of said viscous liquid as remains as contaminating material thereon when said container has been emptied, said method comprising the steps of:

(a) preventing the flow of hot fluid into the existing conduit channels;

(b) selectively and removably coupling adjacent conduit channels by utilizing adequate conduits to effect a change of flow from a series flow pattern to a parallel flow pattern within the conduit channels;

(c) flowing cryogenic liquid having a temperature less than about −100° C. in the conduit channels modified according to step (b);

(d) allowing cryogenic liquid to circulate in the conduit channels for a predetermined period of time to effect at least partial solidification of the contaminant material thereby rendering it more adaptable for removal; and

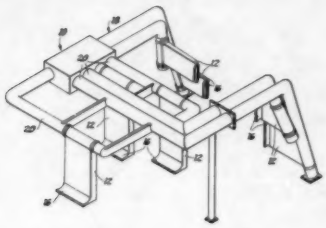
(e) removing the contaminant material treated according to step (d) from the wall.

4,409,035

CLAMP FOR VARYING THE HINGING ACTION OF A FLUID STRIPPING BAG

Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455, and David R. Day, 4334 Ocean Dr., Apt. 203, Corpus Christi, Tex. 78012

Filed Jan. 8, 1982, Ser. No. 338,577
Int. Cl.³ B08B 1/00, 13/00
U.S. Cl. 134—6 19 Claims



15. A method of selectively varying the hinging action of a flexible, inflatable fluid-stripping bag (12) including an elongated bag inlet (14) having a predetermined cross-sectional area and a nozzle (16) at one end thereof, said method comprising the steps of: mounting the bag inlet (14) about an opening (24) of a plenum (20) for supplying air to the bag (12) and selectively varying the cross-sectional area of the bag inlet (14) to vary the hinging action of the bag (12) whereby changing the cross-sectional area of the bag inlet (14) changes the resistance to hinging action of the bag (12).

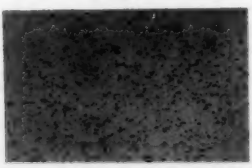
16. A method as set forth in claim 15 further characterized by the steps of disposing an adjustable frame (26) about the periphery of the bag inlet (14) and adjusting the size of the frame (26) to adjustably limit the extent to which the bag inlet (14) opens to determine the cross-sectional area of the bag (12) and securing the frame (26) about the bag inlet (14) and perfecting a seal between the frame (26) and the outer periphery of the opening (24).

4,409,036

ALUMINUM ALLOY SHEET PRODUCT SUITABLE FOR HEAT EXCHANGER FINS AND METHOD

William D. Vernam; Ralph W. Rogers, Jr., and Harry C. Stumpf, all of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1980, Ser. No. 219,574
Int. Cl.³ C22F 1/04; C22C 21/04
U.S. Cl. 148—2 43 Claims



9. A method of producing a wrought aluminum sheet product for fin stock characterized by a substantially uniform distribution of relatively fine, generally equiaxed constituents comprised mainly of elemental silicon, comprising the steps of:

(a) providing a body of aluminum base alloy consisting essentially of 2 to 13 wt.% si, 0 to 4 wt.% Zn, 0.005 to 2 wt.% Sr, up to 1 wt.% Fe and up to 1 wt.% Cu, the balance essentially aluminum and incidental impurities,

(b) rolling said body at temperatures not higher than 925° F. to provide a sheet product, and

(c) forming said sheet into heat exchanger fins.

4,409,037

ADHESION PROMOTER FOR PRINTED CIRCUITS

Adela Landau, Watertown, Conn., assignor to Macdermid Incorporated, Waterbury, Conn.

Filed Apr. 5, 1982, Ser. No. 365,645
Int. Cl.³ C23C 1/10
U.S. Cl. 148—6.14 R 13 Claims

12. A composition for improving the adhesion of copper foil to printed circuit substrates by oxidizing the copper bonding surface, comprising an aqueous solution containing one or more chlorites taken from the group consisting of alkaline earth metal chlorites and alkali metal chlorites at a concentration of from 100 grams per liter to complete saturation, one or more hydroxides taken from the group consisting of sodium and potassium hydroxide at a concentration of from 10 to 25 grams per liter and wherein the ratio of the hydroxide to the chlorite is within the range of from about 1:10 to about 1:20.

4,409,038

METHOD OF PRODUCING AL-LI ALLOYS WITH IMPROVED PROPERTIES AND PRODUCT

John H. Weber, Sloatsburg, N.Y., assignor to Novamet Inc., Wyckoff, N.J.

Filed Jul. 31, 1980, Ser. No. 174,181
Int. Cl.³ C22F 1/04
U.S. Cl. 148—12.7 A 14 Claims

1. A method for producing a dispersion-strengthened aluminum-base alloy of improved mechanical and thermal properties comprising degassing and compacting at elevated temperature below liquation temperature a mechanically alloyed powder consisting essentially of aluminum, lithium, oxygen and carbon, and optionally one or more of the group selected from magnesium, copper and iron, the lithium level being at least about 1.7 up to about 3.5 weight %, the dispersoid comprising the carbon and oxygen, and being present in a small but effective amount for increased strength up to about 8 volume %, and the balance, apart from said optional components, essentially aluminum, and subjecting the compacted powder to a solution treatment at a temperature not exceeding the maximum degassing and/or compaction temperature, cooling the solution treated alloy, and aging the alloy at an elevated temperature for a period of time sufficient to permit age hardening of the alloy.

4,409,039

HIGH STABILITY PRINTING LIQUID, INTENDED MORE PARTICULARLY FOR PRINTING BY INK JET

Jean P. Lepesant, and Georges Tantot, both of Paris, France, assignors to Societe IMAJE, Bourg-les-Valence, France

Filed Mar. 18, 1981, Ser. No. 244,909

Claims priority, application France, Mar. 21, 1980, 80 06400

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—20 **24 Claims**

1. A printing liquid useful in jet ink printing processes which require inks which are macroscopically homogeneous and stable over long periods of time, comprising:

a liquid having the structure of a microemulsion comprising a dispersing phase and a dispersed phase, said phases being separated from one another by an interfacial film which isolates the constituents of the two phases in such a way that any danger of flocculation is avoided.

4,409,040

INK FOR USE IN INK-JET PRINTER

Isao Tabayashi, Tokyo; Hiromi Soma, Warabi, and Hiroshi Fukutomi, Urawa, all of Japan, assignors to Dainippon Ink and Chemicals Inc., Tokyo, Japan

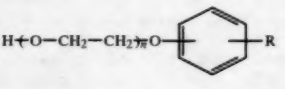
Filed Feb. 12, 1982, Ser. No. 348,159

Claims priority, application Japan, Feb. 18, 1981, 56-21432

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—20 **13 Claims**

1. Ink for use in an ink-jet printer, said ink comprising a solution in water of a water-soluble dye, a wetting agent and a compound of the following formula



wherein R represents $-C_mH_{2m+1}$ or $-O-C_mH_{2m+1}$, m represents 0 or an integer of 1 to 6, and n represents an integer of 1 to 10.

4,409,041

AMORPHOUS ALLOYS FOR ELECTROMAGNETIC DEVICES

Amitava Datta, Madison; Lance A. Davis, Morristown; Nicholas J. DeCristofaro, Chatham, and Jordi Marti, Randolph, all of N.J., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 191,475, Sep. 26, 1980. This application Jul. 29, 1981, Ser. No. 286,918

Int. Cl.³ C04B *35/00*

U.S. Cl. 148—31.55 **8 Claims**

1. A magnetic alloy consisting essentially of iron, boron and silicon having at least 85 percent of its structure in the form of an amorphous metal matrix, said alloy having been annealed at a temperature and for a time sufficient to induce precipitation of discrete particles of its constituents in said amorphous metal matrix, said particles having an average size ranging from about 0.05 m to 1 m and an average interparticle spacing of about 1 m to 10 m, and constitute an average volume fraction of said alloy of about 0.01 to 0.3.

4,409,042

METHOD AND APPARATUS FOR MEASURING THE TEMPERATURE OF MOVING ELONGATED ARTICLES AND APPLICATION THEREOF

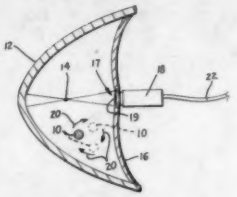
Georg C. E. Dornberger, and Robert E. Streich, both of Phoenix, Ariz., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 19, 1982, Ser. No. 360,105

Int. Cl.³ C22F *1/00*; B21C *9/00*

U.S. Cl. 148—129 **4 Claims**

2. The method of annealing a metallic wire comprising the steps of passing the wire over two spaced electrodes across which a voltage is applied, within the bounds of a radiant heat reflective wall of substantially parabolic cross-sectional or paraboloidal shape with the path of wire travel offset from the



wall focal axis or point, sensing the temperature of the wire by sensing the magnitude of radiant heat emanating from the wall focal axis or point, and controlling the magnitude of the voltage as a function of sensed wire temperature.

4,409,043

AMORPHOUS TRANSITION METAL-LANTHANIDE ALLOYS

Norman C. Koon, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1981, Ser. No. 314,326

Int. Cl.³ C22C *19/00*

U.S. Cl. 148—403 **20 Claims**

1. An alloy represented by the formula:

$(M_wX_xB_{1-w-x})_{1-y}(R_zLa_{1-z})_y$ wherein w is from about 0.7 to about 0.9; x is from 0 to about 0.10; y is from about 0.05 to about 0.15; z is from 0 to about 0.95; M is selected from the class consisting of iron, cobalt, an iron-cobalt alloy, an iron-manganese alloy having at least 50 atomic percent iron, an iron-nickel alloy having at least 50 atomic percent iron, an iron-cobalt-manganese alloy having at least 50 atomic percent iron and cobalt, an iron-cobalt-nickel alloy having at least 50 atomic percent iron and cobalt, and an iron-cobalt-manganese-nickel alloy having at least 50 atomic percent iron and cobalt; X is an auxiliary glass former selected from the class consisting of phosphorous, carbon, silicon, aluminum, arsenic, germanium, indium, antimony, bismuth, tin, and mixtures thereof, and R is selected from the group consisting of cerium, praseodymium, neodymium, and mixtures thereof, said alloy having an amorphous microstructure.

4,409,044

WATER-IN-OIL EMULSION EXPLOSIVES AND A METHOD FOR THE PREPARATION OF THE SAME

Dhirendra N. Bhattacharyya, Maharashtra; Srinivasachari Seshan, Giridih; John S. Campbell, Maharastra, and Soumendranath Sen, Giridin, all of India, assignors to Indian Explosives Limited, Calcutta, India

Filed Nov. 18, 1982, Ser. No. 442,670

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **10 Claims**

1. An improved water-in-oil emulsion explosive composition which comprises

(i) 5 to 30% by weight of water;

(ii) 3 to 15% by weight of a water-insoluble, emulsifiable, liquid or liquefiable carbonaceous fuel;

(iii) 20 to 80% by weight of inorganic oxidiser salt;

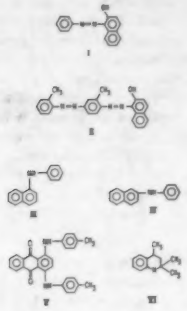
(iv) optionally 0.02 to 0.5% by weight of gassing agent;

(v) 0.5 to 4% by weight of emulsifier; and

(vi) optionally, water- and/or fuel-soluble thickening agent, flame-quenching coolant and/or metallic particulate fuel characterised in that the composition also contains;

(vii) 0.02 to 2% by weight of a stabiliser selected from the group consisting of organo-sulphur compounds, organic

compounds containing quaternary nitrogen, phenolic compounds and substituted derivatives thereof, dihydroxybenzenes, quinones, unsubstituted and substituted



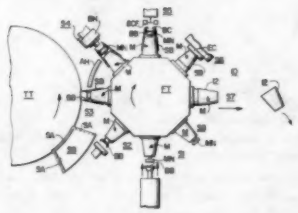
aryl diazo compounds, unsubstituted and substituted aryl amines and salts thereof, unsubstituted and substituted quinolines and mixtures of any two or more of said stabilisers.

4,409,045

METHOD AND APPARATUS FOR SEALING THE SIDEWALL AND BOTTOM SEAM PORTIONS OF TWO-PIECE CONTAINERS DURING MANUFACTURE THEREOF

Charles E. Busse, Jarrettsville, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Jul. 20, 1982, Ser. No. 399,980
Int. Cl.³ B29C *27/00;* **B65B** *7/00*
U.S. Cl. 156—69 **29 Claims**



8. A seaming means for sealing the side and bottom seams of a two-piece container comprising:

mandrel means for supporting the bottom blank and sidewall portions of a said container, said mandrel means including forming section means having a peripheral surface shaped to conform to the ultimate sidewall configuration of a said container and including a side seaming area extending longitudinally of said peripheral surface for supporting a lapped side seam of said container;

seam clamp means coextensive with said side seaming area and extending to a position beyond said forming section means coincident with a desired wet bottom line for said sidewall portion of said container for compressing the said lapped side seam against said side seaming area;

said mandrel means further including tip means mounted for selective movement toward and away from said forming section means and having a peripheral surface shaped to conform to the ultimate bottom blank and sidewall configuration of the bottom end of said container;

said tip means in its closest position to said forming section means having a portion of its peripheral surface coincident with and acting as an extension of said side seaming area for compressing a coextensive portion of said lapped side seam against said seam clamp means and in its most extended position having its peripheral surface symmetrically disposed with respect to said forming section means and conformally disposed with respect to the ultimate shape and location of the bottom most portion of said container to be fabricated on said mandrel means; and

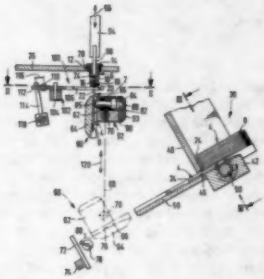
said tip means, in translation from said closest to said most extended position progressively compressing said lapped side seam against said seam clamp means from said forming section means to a wet bottom line.

4,409,046

METHOD OF AND AN APPARATUS FOR PRODUCING DISPOSABLE SYRINGES AND THE DISPOSABLE SYRINGE PRODUCED

Friedrich Holzwarth, Schorndorf, and Gerhard Heinze, Weissach, both of Fed. Rep. of Germany, assignors to SORTIMAT Creuz & Co. GmbH, Winnenden, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 214,879
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1979, 2949553; Dec. 2, 1980, 3045411; Dec. 2, 1980, 3045453
Int. Cl.³ A61M *5/34;* **B29C** *19/06, 27/30*
U.S. Cl. 156—73.6 **29 Claims**



1. In a method for fusing a metallic syringe tube having an inner end and a free end into a plastic fitting by pushing the inner end of the syringe tube into the fitting so that the inner end of the syringe tube contacts the fitting, clamping the syringe tube between a counterelectrode which acts as an abutment for the inner end of the syringe tube and a clamping jaw which engages the free end of the syringe tube, and temporarily applying a resistance heating voltage between the counterelectrode and the free end of the syringe tube projecting from the fitting for heating at least a portion of the syringe tube inner end in contact with the fitting to at least the melting temperature of the plastic forming the fitting, while at the same time displacing the clamping jaw and the counterelectrode relatively toward one another, the improvement wherein said step of applying a resistance heating voltage is carried out by applying such voltage between the counterelectrode and a location on the free end of the syringe tube between the fitting and the clamping jaw such that the voltage is applied along a length of the syringe tube which is shorter than the length of the syringe tube between the clamping jaw and the counterelectrode, and said method further comprises maintaining the length of the syringe tube along which the voltage is applied substantially constant during said step of temporarily applying.

29. In a method for fusing a metallic syringe tube having an inner end and a free end into a plastic fitting by pushing the inner end of the syringe tube into the fitting, clamping the syringe tube between a counterelectrode which acts as an abutment for the inner end of the syringe tube and a clamping jaw which engages the free end of the syringe tube, and temporarily applying a resistance heating voltage between the counterelectrode and the free end of the syringe tube projecting from the fitting, the improvement comprising laterally expand-

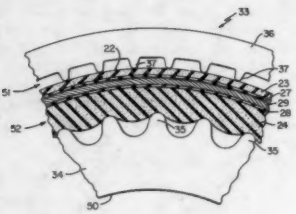
ing the inner end of the syringe tube within the fitting by inserting an expansion mandrel into the syringe tube inner end for securing the tube to the fitting, wherein said step of inserting comprises vibrating the mandrel.

4,409,047

METHOD OF MAKING A TOP TOOTHED ENDLESS POWER TRANSMISSION BELT CONSTRUCTION AND A BELT CONSTRUCTION MADE BY SUCH METHOD

Alden W. Brooks, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Mar. 10, 1982, Ser. No. 357,242
Int. Cl.³ B29H *7/22*; F16G *1/00*
U.S. Cl. 156—138 **18 Claims**



1. In a method of making a top toothed endless power transmission belt construction formed mainly of polymeric material and comprising the steps of disposing said material in substantially cylindrical form on a substantially cylindrical drum-like member, disposing a substantially cylindrical toothed member about said disposed material, and compressing at least one of said members toward the other of said members with the pressure of pressurized steam to form top teeth in said material and cure the thus formed material with the heat of said steam into a top toothed belt construction, the improvement comprising the steps of introducing pressurized steam against said other member during part of the time that said one member is being compressed toward said other member by said pressure of said pressurized steam, temporarily releasing said pressure on said one member before said polymeric material has been cured to permit the gas that has been initially heated and thereby expanded in said polymeric material to escape therefrom, and temporarily releasing the pressure against said other member at the same time that said pressure on said one member is released, said step of temporarily releasing the pressure against said other member ending after said step of temporarily releasing the pressure on said one member ends so that when said pressure on said one member is initially reapplied a maximum pressure differential exists across said one member and acts in a direction to compress said one member toward said other member for a period of time before said pressure on said other member is initially reapplied.

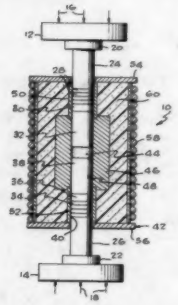
10. In a method of making a top toothed endless power transmission belt construction formed mainly of polymeric material and comprising the steps of disposing said material in substantially cylindrical form on a substantially cylindrical drum-like support member, disposing a substantially cylindrical collapsible toothed matrix means about said disposed material, and compressing said toothed matrix means toward said inner support member with the pressure of pressurized steam applied against said matrix means to form top teeth in said material and cure the thus formed material with the heat of said steam into a top toothed belt construction, the improvement wherein said step of compressing comprises the steps of initially compressing said matrix means toward said inner support member with said pressurized steam for a first period of time that heats the gas in said polymeric material to expand the gas before the curing of said polymeric material, introducing pressurized steam inside said support member during said first period of time, thereafter releasing said pressure on said matrix means and inside said support member for a second period of time to permit said expanded gas to escape from said polymeric material, then again compressing said matrix means toward said inner support member with said pressurized steam for a third period of time to final form said top teeth and cure the thus formed top toothed belt construction, and then again introducing said pressurized steam inside said support member during said third period of time, said step of again introducing said steam inside said support member beginning after said step of again compressing said matrix means so that when said pressure on said matrix means is initially reapplied a maximum pressure differential exists across said matrix means and acts in a direction to compress said matrix means toward said support member for a period of time before said pressure inside said support member is reapplied.

4,409,048

HIGH TEMPERATURE CONSOLIDATION PROCESS

Donald M. Hatch, Huntington Beach, and Richard J. Larsen, Torrance, both of Calif., assignors to Hitco, Newport Beach, Calif.

Filed Mar. 10, 1975, Ser. No. 556,889
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—155 **20 Claims**



1. A method of making a high density carbon-carbon composite comprising the steps of:

forming a laminate of organic resin impregnated layers of carbon material;

at least partially curing the organic resin;

heating the laminate while applying forces to opposite portions of an outer surface thereof through a temperature range to substantially decompose the resin, said heating occurring at a first rate which provides relatively rapid decomposition of the resin without accompanying delamination of the laminate; and

thereafter continuing to heat the laminate at a second rate greater than the first rate and not less than about 1500° F./hr. while applying forces to opposite portions of an outer surface thereof to a temperature higher than said temperature range and at least high enough to provide substantial softening of the laminate.

4,409,049

METHOD AND APPARATUS FOR EFFECTING INTERMITTENT SECUREMENT OF A STRETCHED ELASTIC MEMBER TO A MOVING WEB

Anthony Passafiume, Burbank, and Heinz A. Pieniak, Chicago, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Apr. 13, 1981, Ser. No. 253,419
Int. Cl.³ B32B *31/10*; A61F *13/16*
U.S. Cl. 156—164 **16 Claims**

1. A method for continuously attaching an elastic member to discrete portions of a moving web to impart an elasticized

character to pre-determined portions of the web while preserving the inelastic character of the other portions of the web, said method comprising the steps of:

(a) moving a first substantially inelastic web;

(b) applying a plurality of continuous adhesive lines to one surface of said first moving inelastic web;

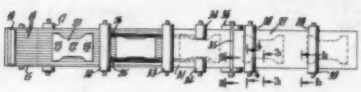
(c) feeding spaced apart absorbent panels, each panel having a narrowed center portion and wider end portions, to the surface of the moving web on which the adhesive has been applied;

(d) feeding a pair of stretched elastic members over at least one adhesive line along the longitudinal edges of said absorbent panel, with the members adjacent the edge of the panel along the narrowed center portion and overlying the panel at its wider end portion;

(e) feeding a second substantially inelastic web to the top surface of the absorbent panel;

(f) laminating the second inelastic web and the first inelastic web together at the edge of the panel to bond the elastic member in place along the narrowed center portion; and

(g) severing the laminate between adjacent absorbent panels whereby the elastic member relaxes in the remaining



unbonded portion to produce a plurality of individual laminated products.

11. Apparatus for continuously attaching an elastic member to discrete portions of a moving web to impart an elasticized character to the outer portions of the web comprising:

(a) means for moving a first inelastic web;

(b) means for continuously applying adhesive to a surface of said first web;

(c) means for feeding shaped absorbent panels having a narrowed center portion and wider end portions in spaced apart relationship to the surface of the first web to which the adhesive is applied;

(d) means for feeding a stretched elastic member over the adhesive along the longitudinal edge of the center portion of the panel and over the wider end portions of said panel;

(e) means for feeding a second web on top of said panel and said elastic member;

(f) means for laminating the second web to the first web adjacent the center portion of the absorbent panel; and

(g) means for severing the first and second webs between adjacent absorbent panels whereby any remaining stretched unadhered portions of the elastic member relax.

4,409,050

METHOD OF MAKING BLADE SUPPORTS

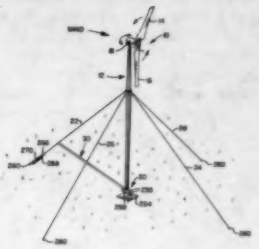
J. Warne Carter, Jr., Burkburnett, and J. Warne Carter, Sr., Wichita Falls, both of Tex., assignors to Carter Wind Power, Wichita Falls, Tex.

Continuation of Ser. No. 139,674, Apr. 14, 1980, abandoned, which is a division of Ser. No. 37,774, May 10, 1979, Pat. No. 4,366,307. This application Dec. 7, 1981, Ser. No. 327,908

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—172 **6 Claims**

1. A method of making a spar for supporting a rotor blade of a wind-driven generator, comprising providing an elongate web, positioning mold pieces against opposite faces of the web to form in conjunction with the web a mold which defines flange spaces along longitudinal edges of the web, then, with the web in the mold, winding filamentary material as a resin impregnated roving over the edges of the web in said spaces, said resin capable of being cured to a hardened state, the winding being conducted lengthwise of the web and being continued for plural turns of the filamentary material around the web perimeter to form flanges along the longitudinal edges of the



web, curing the resin so as to harden the flanges and bond them to the web, and removing the mold pieces from the web.

4,409,051

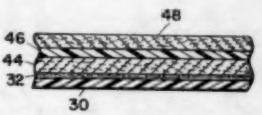
METHOD OF JACKETING A BATTERY WITH A SELF-ADHESIVE BATTERY JACKET AND ARTICLE

Frank L. Ciliberti, Jr., Ossining, N.Y., assignor to Duracell Inc., Bethel, Conn.

Filed Oct. 31, 1979, Ser. No. 89,821

Int. Cl.³ B29C *17/02*

U.S. Cl. 156—212 **1 Claim**



1. A method of jacketing a battery, said battery having exterior surfaces and comprising at least one cell, with a jacket, said jacket initially comprising an outer layer, a release layer, and an electrolyte resistant pressure sensitive adhesive layer positioned between said outer layer and said release layer, and said outer layer of said jacket being a laminate comprised of two absorbent layers with an electrolyte impervious layer positioned therebetween and having hinge lines, said jacket being of predetermined shape to substantially conform to the exterior surfaces of said battery to be jacketed; said method consisting essentially of the steps of removing said release layer, pressing a portion of said jacket to an exterior surface of said battery, folding said jacket along a hinge line to bring another portion of said jacket into alignment with another portion of said battery and pressing it into adhering contact therewith, and repeating the last said steps until said jacket is substantially conformed and adhered to said battery.

4,409,052

METHOD OF MANUFACTURING A TWO-WING DRESS-SHIELDING ELEMENT

Rudolf von Agris, Aachen-Brand; Gunter Kaiser, Wörselen-Broichweiden, and Bernhard Nysten, Aachen, all of Fed. Rep. of Germany, assignors to William Prym-Werke KG, Stolberg, Fed. Rep. of Germany

Filed Apr. 24, 1981, Ser. No. 257,407

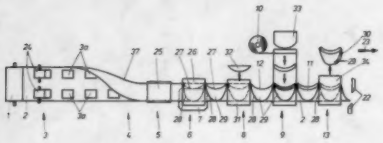
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016424

Int. Cl.³ B32B *31/14*

U.S. Cl. 156—227 **10 Claims**

1. A method of manufacturing a two-wing one-piece dress-shielding element in which each of two wings is composed of an absorbent layer adapted to lie against the body of a user and a moisture-impermeable layer adapted to lie against a dress and

having adhesive points for attaching to the dress upon removal of protective strips, the method comprising the steps of continuously supplying a web composed of a weldable synthetic plastic foil and a fleece layer for forming at least one of the layers of the dress-shielding element to be manufactured; providing a plurality of working stations for performing a plurality of working steps of manufacturing the dress-shielding element, in succession one after the other, said working steps including applying an unsupported adhesive material provided



with the protective strips onto the web at predetermined locations, longitudinally folding the web so as to form a two-wing web with a longitudinal folding edge, deforming the two-wing web in the region of the longitudinal folding edge to form two tips with a concave edge line therebetween, and punching the web to produce a convex contour line for the webs of the dress-shielding element; and displacing the web between said working stations so as to perform said working steps, whereby the web serves as transporting means for the dress-shielding element to be manufactured from the web.

4,409,053

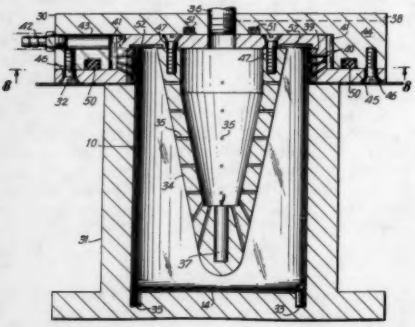
PROCESS FOR MAKING A CONTAINER FOR STORING FOOD

George H. Naugle, Central Valley; Robert L. Gordon, Monroe, and Richard J. Pines, Middletown, all of N.Y., assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 170,582, Jul. 21, 1980, Pat. No. 4,382,767, which is a division of Ser. No. 906,275, May 15, 1978, Pat. No. 4,225,053. This application Aug. 17, 1982, Ser. No. 408,838

Int. Cl.³ B29C *17/04, 27/16*

U.S. Cl. 156—287 **5 Claims**



1. The process for drawing and blow forming plastic into a paperboard outer container and vacuum forming plastic screw threads about the upper portion of said outer container comprising:

(a) positioning in a female mold a paperboard outer container having a circular cross-section at its top and comprising at least one vertical wall so that an upper portion of said paperboard outer container extends outside said female mold;

(b) providing a male mandrel arranged and constructed so that it may engage the female mold;

(c) heating a layer of plastic;

(d) positioning said layer of heated plastic between said female mold and said male mandrel;

(e) drawing said plastic into said paperboard outer container positioned in said female mold whereby a first portion of said plastic abuts said male mandrel and is spaced from the interior of said paperboard outer carton and a second portion of said plastic extends in close proximity about the upper portion of the outside surface of said paperboard outer container;

(f) blow forming the plastic in said paperboard container into substantial abutment with said at least one vertical wall by directing gas from said male mandrel into the interior of said female mold;

(g) vacuum forming plastic screw threads about the upper portion of said outer container by applying a vacuum to said second portion of said plastic.

4,409,054

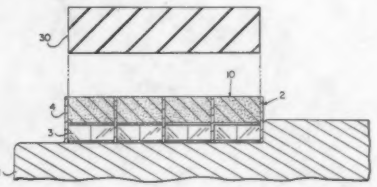
METHOD FOR APPLYING ABRADABLE MATERIAL TO A HONEYCOMB STRUCTURE AND THE PRODUCT THEREOF

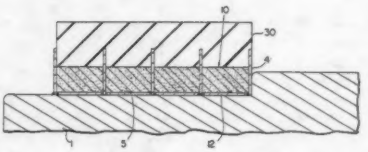
Edward J. Ryan, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 14, 1981, Ser. No. 225,074

Int. Cl.³ B29C *19/00;* **B32B** *31/00, 3/12;* **B23K** *35/24*

U.S. Cl. 156—293 **1 Claim**





1. A method for filling a honeycomb structure comprised of a plurality of cells having a predetermined depth with an abradable material including the steps of:

a. providing a composite abradable preform consisting of a layer of powdered material containing a substantial amount of braze alloy, a second layer joined to the first layer comprising a powdered abradable composition, both of said layers also containing a binder and a plasticizer and being flexible and compliant said preform having a thickness which is less than the depth of the honeycomb cells;

b. placing said preform on the honeycomb structure to be filled with the braze containing surface adjacent the honeycomb;

c. forcing the preform into the cells and using a disposable pliable material to force the preform into the cells braze containing surface contacts the bottom of the honeycomb cells heating the filled honeycomb to remove the binder and plasticizer and further heating to melt the braze material so as to bond the abradable material to the honeycomb structure.

4,409,055

ADHESION OF RUBBER TO ARAMID CORDS

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 331,698, Dec. 17, 1981, abandoned. This application Jan. 12, 1983, Ser. No. 457,500

Int. Cl.³ B29H *5/02;* B32B *27/34;* C09J *5/02*

U.S. Cl. 156—307.5 14 Claims

1. A method for adhering a poly(p-phenylene terephthalamide) reinforcing element to a rubber compound which comprises (I) treating said element with a composition comprising an aqueous alkaline dispersion of about 10 to 50% by weight of solids consisting essentially of (a) a rubbery vinyl pyridine copolymer and (b) at least one water soluble thermosetting resin prepared from reactants consisting essentially of a compound selected from the group consisting of phenol, resorcinol, the cresols, the xylenols, p-tert butylphenol and p-phenyl phenol and mixtures thereof and of an aldehyde donor selected from the group consisting of formaldehyde, acetaldehyde, furfural, paraformaldehyde and hexamethylenetetramine and mixtures thereof in an amount of from about 3 to 25 parts by weight dry per 100 parts total by weight dry of (a), heating said treated element at a temperature of from about 200° to 600° F. for from about 300 to 5 seconds to remove essentially all of the water from said composition and to provide said element with a heat cured or heat set adhesive, and repeating step (I) at least one more time, to provide said reinforcing element with a dry adhesive in an amount of up to about 20% total by weight (dry) based on the weight of said reinforcing element, and (II) combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized vulcanizable rubber compound and vulcanizing the same.

4,409,056

CURABLE SEALING COMPOSITION

Hideo Takamatsu, and Shobu Minatono, both of Ibaragi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 227,746, Jan. 23, 1981, abandoned, which is a continuation of Ser. No. 70,612, Aug. 29, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 326,052

Claims priority, application Japan, Sep. 12, 1978, 53-112673; Sep. 12, 1978, 53-112674

Int. Cl.³ C09J *3/10*

U.S. Cl. 156—334 4 Claims

1. A method for sealing contacting surfaces comprising:

applying to said contacting surfaces a curable sealing composition comprising a low molecular weight rubber, a curing agent and optionally, at least one other rubber compounding agent, said low molecular weight rubber being a block copolymer of isoprene and butadiene selected from the group consisting of B—I—B, $(B—I)_n$, and $(B—I)_n—B$, wherein B is a polybutadiene block, I is a polyisoprene block, and n is an integer of 2–10, with a viscosity average molecular weight of 7,000–150,000, said viscosity average molecular weight calculated by the equation:

$$[\eta]=1.21\times10^{-4}Mv^{0.77}$$

where $[\eta]$ is the intrinsic viscosity as measured in toluene at 30° C.

4,409,057

STAPLE SUPPORTING AND REMOVING STRIP

Robert P. Molenda, Stillwater, and George R. Rabuse, Sunfish Lake, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

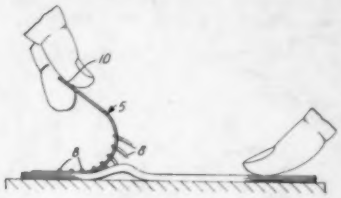
Filed Jan. 19, 1981, Ser. No. 226,114

Int. Cl.³ B32B *19/00*

U.S. Cl. 156—92 11 Claims

1. A staple-supporting strip for use in overlying sheets to be stapled and affording subsequent removal and retention of the staples comprising a narrow elongate strip of tough polymeric material with a thickness of between 0.1 and 0.15 mm (0.004 and 0.006 inch) and having a width dimension of between about 1.5 cm and 2.5 cm (0.5 and 1 inch) and having a length of between 3 cm and 9 cm (1.13 to 3.5 inches), and a band of microsphere structured adhesive means on said strip for temporarily adhering said strip to the surface of a said sheet with no build-up in the adhesive bond, thereby permitting removal of the strip without deleteriously affecting said surface or leaving a residue at any time upon the subsequent removal of the strip.

11. Method of preparing staples for removal from documents comprising the steps of:



placing on the sheets to be stapled a narrow elongate strip of tough polymeric material having a width dimension of between about 1.5 cm and 2.5 cm and having a length between about 3 cm and 9 cm,

pressing the strip against the uppermost sheet to adhere the strip to the sheet by contacting an adhesive coated area of the strip to said uppermost sheet,

placing the legs of a wire staple across the width of the strip and through said strip and the sheets being stapled,

whereby upon grasping an end of a said strip the strip can be peeled from said uppermost sheet and the staple will be drawn out of said sheets.

4,409,058

BAND TYPE STRAPPING MACHINE

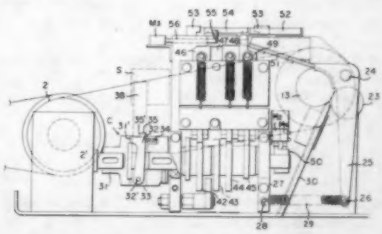
Isaku Suwabe, Mishima, and Motoaki Mori, Yokohama, both of Japan, assignors to Nichiro Kogyo Company, Ltd., Yokohama, Japan

Filed Feb. 17, 1982, Ser. No. 349,461

Claims priority, application Japan, Oct. 7, 1981, 56-149333[U]

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—361 5 Claims



1. A band type strapping machine comprising a feeding and tightening roller driven by a motor, an auxiliary roller in contact with the feeding and tightening roller, a cam shaft which is rotated by said motor through a reduction gear and a clutch mechanism and which has cams for respectively actuating a rear gripper, a heater, a press bar and a front gripper, an improvement characterized in that said motor is capble of instantaneous change of normal and reverse rotations and has a large starting torque and an electromagnetic clutch is fitted

to the rotary shaft of said tightening and feeding roller so as to be movable in the axial direction depending upon increase of a band tightening force whereby detection of the tightening force caused by the movement of said electromagnetic clutch is mechanically related to the engagement or disengagement of said clutch mechanism.

4,409,059

REINFORCED STRUCTURES

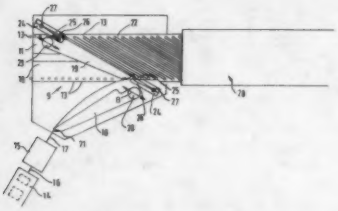
Eric Holroyd, Knutsford, and David J. B. Perkins, Liverpool, both of England, assignors to W & A Bates Limited, London, England

Filed Oct. 9, 1981, Ser. No. 310,394

Claims priority, application United Kingdom, Oct. 16, 1980, 8033331

Int. Cl.³ B29H *17/04, 9/04;* D04H *3/05*

U.S. Cl. 156—397 **19 Claims**



1. Apparatus for making a tire breaker fabric comprising an elongate sheet of tire cord fabric embedded in elastomer in which the cords extending across the sheet are formed by one single continuous tire cord which extends back and forth across the sheet so that the edges of the sheet are formed by a series of folded cord edges, the apparatus comprising:

(a) a pair of parallel spaced-apart retaining means;

(b) each retaining means comprising a plurality of longitudinally spaced fixed pegs attached to endless belt means;

(c) a feed unit for one single continuous tire cord;

(d) guide means for guiding said tire cord to and fro between said retaining means;

(e) said guide means being shaped to impart a fold to the tire cord at each retaining means to form a continuous elongate cord assembly the edges of which are formed by a series of folded cord edges;

(f) respective clip means associated with each retaining means to receive and transfer each folded cord edge to a respective peg of the associated retaining means;

(g) stepwise drive means to move said endless belt means in the direction of its length;

(h) means for applying elastomer to said cord assembly to produce tire breaker fabric; and

(i) means for removing said retaining means from said tire breaker fabric.

4,409,060

EDGE BANDING MEANS

Werner J. Janssens, Auckland, New Zealand, assignor to W. J. Janssens Industries (N.Z.) Limited, Auckland, New Zealand

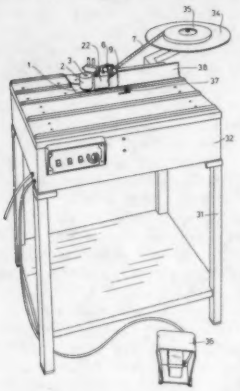
Filed Aug. 7, 1981, Ser. No. 290,922

Claims priority, application New Zealand, Aug. 11, 1980, 194631

Int. Cl.³ B32B *31/10*

U.S. Cl. 156—497 **11 Claims**

1. An edge banding machine comprising a heating means for blowing heated gas onto one surface of a tape to heat the same, a feeding means for feeding the tape past the heating means wherein the direction of travel of the tape is from upstream to downstream, an applying means immediately downstream of the heating means for pressing heated tape onto a surface to which it is to be adhered, and a severing means upstream of the heating means for cutting the tape to the length of the surface to which it is to be adhered, the heating means having a fixed nozzle for directing the gas onto the tape, the downstream edge of said nozzle being rebated to allow some of the gas to travel along the direction of movement of the tape, wherein the machine further comprises a guiding means for supporting the tape by its edges and guiding the tape directly in front of the nozzle, said guiding means being vertically adjustable to accommodate tapes of different widths and comprising a movable barrier which extends across part of the nozzle so that, whenever a tape is fed past the nozzle, the guiding means blocks off that portion of the nozzle which is not covered by the tape, the construction and arrangement being such that, in use, the heated gas issuing through the nozzle is directed towards an empty space when no tape is presented for heating, and when a tape is presented for heating it is interposed into the path of the heated gas, whereby in neither case does the heated gas impinge on moving parts of the machine.



4,409,061

MACHINE FOR TYING PACKAGES

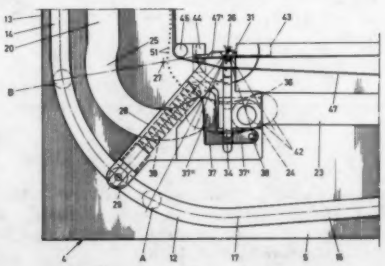
Hans H. Büttner, Obmettmann 13, 4020 Mettmann, Fed. Rep. of Germany

Filed Feb. 17, 1982, Ser. No. 349,543

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110718

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—502 **17 Claims**



1. A machine for the tying of packages having a gripper which grips and places the tying means around the package along a first predetermined path, the gripper being moved by a pull means, such as a chain, along a second predetermined

path, the gripper being stopped after placement of the tying means around the package in a basic position near a closing device which connects the tying means and has a holding clamp for the end of the tying means, the improvement wherein

forming a predetermined arcuate section of said second predetermined path with a predetermined center point and locating said basic position of the gripper approximately at said center point.

4,409,062

ROTARY BINDER

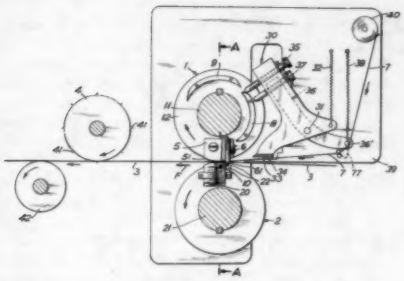
Paolo Conti, Via Neri di Bicci 14, Firenze, Italy

Filed Dec. 9, 1981, Ser. No. 329,027

Claims priority, application Italy, Dec. 10, 1980, 9616 A/80

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—518 **9 Claims**



1. A rotating binder for binding continuous sheets of a form having perforated margins comprising:

rotary means for moving said form along a given axial direction;

a rotary spool of gummed tape;

a first head mounted rotatably above said form and a second head mounted rotatably below said form;

said first and said second heads rotating in said axial direction in synchronism with one another and with said rotary means;

said heads carrying means having a trajectory whose development on said form is equal to an integral multiple of the pitch of the perforation and adapted to fix, cut and tear off a strip of tape obtained from said spool;

means for unwinding said spool before the formation of said strip;

means for stopping said tape before the detachment of said strip;

means for causing the front portion of said strip to pass through one of said perforations in the margin of the form; and

means for bending a tip of said strip and fixing it to the bottom sheet of said form.

4,409,063

APPARATUS AND PROCESS FOR HOT-STAMPING CONTAINERS

Robert Brown, New York, N.Y., assignor to Rheological Systems, Inc., West Babylon, N.Y.

Division of Ser. No. 100,334, Dec. 5, 1979, Pat. No. 4,343,670.

This application Dec. 3, 1981, Ser. No. 327,260

Int. Cl.³ B44C *31/00*; B32B *31/00*; C09J *5/00*

U.S. Cl. 156—542 **9 Claims**

1. An apparatus for imparting hot die transfer of metal or pigmented metal material from a carrier onto circular plastic containers comprising a stationary die having mounting means providing substantially free universal die movement, spaced mounting means having means providing individual container rotation and for receiving containers thereon intended for die transfer, means for biasing the container against the die to effect linear engagement therebetween, and advancing the container across the face of the die to effect simultaneous rotation of the container and successive transfer of foil received on a flexible tape pressed between confronting surfaces of the die and container respectively and under a control force matrix while the combination of pressure and temperature effects a viscoelastic condition of the surface of the container prior to the transfer of foil.

4,409,064

PROCESS FOR CONCENTRATING SULFURIC ACID IN AN EVAPORATOR

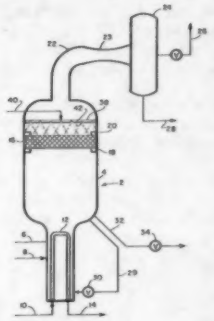
Suresh M. Vora, Whitehall; William J. Mazzafro, Schnecksville; Pierre L. T. Brian, Allentown, and Michael S. K. Chen, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 951,553, Oct. 16, 1978, abandoned.

This application Nov. 9, 1981, Ser. No. 319,157

Int. Cl.³ B01D *1/00*; C01B *17/90*

U.S. Cl. 159—47.1 **6 Claims**



1. A process for concentrating sulfuric acid which comprises:

(a) introducing an aqueous feed sulfuric acid into an evaporator;

(b) heating the feed sulfuric acid in said evaporator to a temperature sufficient to evaporate the water and form a vapor rich in water and leave a concentrated bottoms product rich in sulfuric acid;

(c) passing the vapor rich in water through a knitted wire mist eliminator pad to remove droplets from the vapor stream;

(d) scrubbing vaporized sulfuric acid from the vapor stream by spraying water or sulfuric acid through the mist eliminator pad at a rate of from 0.6–2.5 pounds liquid per pound of vapor passing through said mist eliminator pad, said liquid being sprayed substantially uniformly over said pad to provide a wetting rate of 0.10–0.35 gallons per minute per square foot of mist eliminator pad surface area, said mist eliminator pad having a wire diameter of 0.001–0.05 inches, and interfacial area of from 50–200 feet squared per cubic foot, a void space of from 90–99.7% and a thickness of 4–16 inches;

(e) collecting the scrubbed vapor from the mist eliminator pad as an overhead fraction; and

(f) collecting a concentrated sulfuric acid solution as a bottoms fraction.

4,409,065

KRAFT PAPER

Alexander Kasser, Innsbruck, Austria, assignor to Technopulp A.G., Switzerland

Continuation-in-part of Ser. No. 870,235, Jan. 16, 1978, abandoned. This application Jun. 13, 1979, Ser. No. 48,129
Claims priority, application Austria, Jan. 26, 1977, 474/77
Int. Cl.³ D21D 1/00
U.S. Cl. 162—9 7 Claims

1. In a method for the production of kraft paper comprising the steps of preparing the pulp in a conventional manner including beating or refining or treating the pulp in a Kollergang to produce a refined pulp,

the improvement for producing kraft paper for heavy paper bags having increased tensile energy absorption and an elastic stretch exceeding 1.8%, comprising dewatering said refined pulp to a water content of substantially 20% to 60%, processing said dewatered pulp by separate curlation to curl the fibers to an average factor of curl exceeding 1.3, dispersing said curled pulp with water to a curled fiber content of approximately 0.09% to 0.21%, promptly forming a wet web from said pulp before the fibers restraighten, and drying the wet web while maintaining low tension so that the curl of the fiber is maintained.

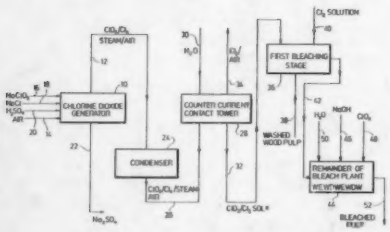
3. Paper sack made of kraft paper according to claim 1 wherein the elastic stretch exceeds 1.8%.

4,409,066

BLEACHING PROCEDURE USING CHLORINE DIOXIDE AND CHLORINE SOLUTIONS

Douglas W. Reeve, and W. Howard Rapson, both of Toronto, Canada, assignors to Erco Industries Limited, Islington, Canada

Continuation-in-part of Ser. No. 98,190, Nov. 22, 1979, Pat. No. 4,325,783, which is a continuation-in-part of Ser. No. 23,845, Mar. 26, 1979, abandoned. This application Mar. 22, 1982, Ser. No. 360,598
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ C01B 11/02; D21C 9/14
U.S. Cl. 162—88 14 Claims



1. A method of bleaching pulp using chlorine dioxide, which comprises:

(a) continuously forming a gaseous mixture of chlorine dioxide, chlorine and steam by:

(i) continuously feeding a sodium chlorate solution to an aqueous acid reaction medium present in a unilocular reaction zone,

(ii) continuously feeding sulphuric acid to said aqueous reaction medium in an amount to maintain the total acid normality of the reaction medium in the range of about 2 to about 4.8 normal,

(iii) continuously feeding sodium chloride, hydrochloric acid or a mixture of sodium chloride and hydrochloric acid to said aqueous reaction medium,

(iv) continuously maintaining said reaction medium at a temperature of about 55° to about 85° C. while maintaining said reaction zone under a subatmospheric pressure of about 80 to about 300 mm Hg to cause the formation of chlorine dioxide and chlorine and the evaporation of water from the reaction medium,

(v) continuously depositing anhydrous neutral sodium sulphate from the reaction medium in said reaction zone once the reaction medium becomes saturated thereby after start up, and

(vi) continuously removing the gaseous mixture of chlorine dioxide, chlorine and steam from the reaction zone;

(b) continuously cooling said gaseous stream to a temperature of about 3° to about 60° C. to cause condensation of at least a substantial proportion of the steam therefrom to provide a chlorine dioxide- and chlorine-containing gas stream;

(c) continuously contacting the latter gas stream with water having a temperature of about 0° to about 22° C. at a flow rate sufficient to form an aqueous solution of chlorine dioxide and chlorine containing chlorine in an amount of 6 to 10% of the available chlorine of the solution, and a gaseous chlorine stream; and

(d) bleaching a cellulosic fibrous material pulp for about 10 to about 60 minutes at a temperature of about 35° to about 70° C. in an aqueous suspension having a consistency of about 2 to about 16% by weight of pulp and containing dissolved organic material in an amount of greater than 2 to about 10% by weight TOC on pulp at an overall equivalent chlorine concentration of about 2 to about 10% by weight of the pulp, by:

(i) subjecting said suspension to a first bleaching step at an acid pH value using at least part of said aqueous solution of chlorine dioxide and chlorine formed in step (c), and

(ii) without an intermediate washing step, subjecting the suspension to a second bleaching step at an acid pH using chlorine solution, formed at least part of said gaseous chlorine stream from step (c), and commencing about 5 seconds to about 10 minutes after commencement of said first bleaching step,

the chlorine dioxide in said aqueous solution of chlorine dioxide and chlorine constituting about 20 to about 90% of the total available chlorine used in said first and second bleaching steps.

4,409,067

QUENCHING METHOD AND APPARATUS

Jimmy B. Smith, Columbia, Tenn., assignor to Peabody Coal Company, St. Louis, Mo.

Filed May 5, 1982, Ser. No. 374,944
Int. Cl.³ C10B 39/04, 45/00
U.S. Cl. 201—1 5 Claims

1. A method for quenching hot particulate char material, which comprises;

gravity feeding said material from a shaft furnace through a confined space from the top thereof while discharging the material from the bottom of said space at a rate such as to maintain a downwardly moving stack in the space with a gap between the top of the stack of said material and the top of the space,

forming a void in the stack intermediate the top and bottom thereof, which void is at least partly defined by said material,

spraying water at a controlled rate onto material at the top of the stack and onto the material defining said void,

withdrawing steam at a controlled rate from the gap and the void,

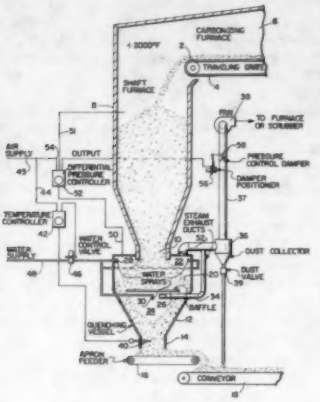
sensing the temperature of the material discharging from the bottom of the stack,

sensing the pressure prevailing in the shaft furnace,

sensing the pressure of steam in the gap,

controlling the rate of water sprayed in accordance with the sensed temperature of the discharging material such as to maintain said temperature below a predetermined maximum and controlling the rate of withdrawal of steam from

the gap and void in accordance with the sensed pressure in the gap such as to maintain the steam pressure therein



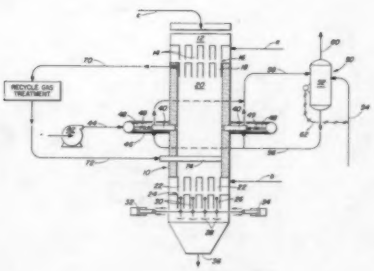
below a predetermined maximum and below the pressure prevailing in the shaft furnace.

4,409,068

INJECTOR FOR CALCINER

Richard L. Davis, Billings, Mont.; Harlan G. Graf, and Don L. Edwards, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 14, 1982, Ser. No. 388,339
Int. Cl.³ C10B *1/04, 49/06*
U.S. Cl. 202—85 **8 Claims**



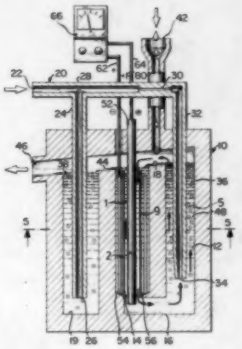
1. In an internally fired, vertical shaft kiln for calcining petroleum coke comprising a vertical shaft kiln having a top and bottom and an outer wall and an inner refractory lining, means for providing green particulate petroleum coke to the top of said shaft kiln to provide a coke bed, means for removing calcined coke from said coke bed at the bottom of said shaft kiln and means for introducing recycle gas and combustion gas to the interior of said shaft kiln at an intermediate level in said coke bed, the improvement which comprises said means for introducing combustion gas comprising at least one tubular combustion gas injector having a longitudinal central orifice and extending through said outer wall and refractory lining and terminating at a point short of the interior surface of said refractory lining, said injector having an annular coolant circulation space disposed therearound and means for providing a coolant to said annular space.

4,409,069

METHOD OF DETERMINING SULFUR DIOXIDE IN GASES AND APPARATUS THEREFOR

Harald Luft, Niederzier, Fed. Rep. of Germany, assignor to Kernforschungsanlange Jülich GmbH, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,411
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 31088809
Int. Cl.³ G01N *27/50*
U.S. Cl. 204—1 T **10 Claims**



1. An apparatus for polarographic analysis of sulfur dioxide in gases by measurement of the anodic oxidation current due to said sulfur dioxide comprising:

(a) a housing having a first and a second tubular chamber and upper and lower connecting means for interconnecting said chambers at their upper and lower portions respectively,

(b) a measuring electrode within said second chamber,

(c) a non-polarizable copper counter electrode within said second chamber spaced apart from said measuring electrode so as to permit electrolyte to be placed therebetween;

(d) a gas inlet tube within said first chamber having an opening proximate to the bottom part of said chamber for the introduction of gas to be analyzed into said chamber when said housing is filled with electrolyte, the difference of the density of the undissolved gas containing electrolyte in said first chamber and the density of the electrolyte in said second chamber capable of creating a circulation of gas saturated electrolyte in the housing when said housing is charged with electrolyte;

(e) means for connecting a source of electrical potential across said electrodes,

(f) means for measuring the current flowing between said electrodes when the device is charged with electrolyte, gas passed thereinto and potential applied across the electrodes, and

(g) inflow and outflow means for the continued supply of fresh electrolyte to said chambers.

10. Process for measuring the limiting current of sulfur dioxide in a gas containing sulfur dioxide utilizing the apparatus of claim **1** comprising the steps of:

(a) charging a suitable electrolyte to the chambers,

(b) passing the gas to be analyzed into the electrolyte through the gas inlet tube,

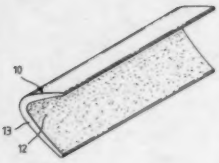
(c) measuring the current generated in the cell.

4,409,070

METHOD OF FORMING ARTICLES BY PLATING

James W. Stevens, Hatfield, England, assignor to British Aerospace Public Limited Company, London, England

Filed May 7, 1982, Ser. No. 376,139
Claims priority, application United Kingdom, May 8, 1981, 81114/63
Int. Cl.³ C25D 1/00, 1/20
U.S. Cl. 204—4 12 Claims



1. A method of forming an article having a rough surface for being adhesively bonded to a further member which method comprises the steps of

(i) applying a discontinuously surfaced layer of electrically conducting material to the surface of a substrate of electrically conducting curable elastomeric material,

(ii) pressing said layer onto said surface of the substrate so that portions thereof are embedded in said surface,

(iii) electroplating the exposed parts of said layer with a metal, and

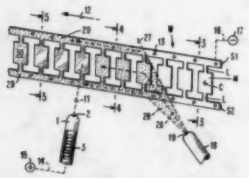
(iv) releasing the substrate from the formed article, the portions of the discontinuously surfaced layer which formerly were embedded in the substrate serving to define a roughened adhesive-receptive surface.

4,409,071

MASKING FOR SELECTIVE ELECTROPLATING JET METHOD

Eric P. Dibble, Endicott, and Thomas E. Lynch, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,034
Int. Cl.³ C25D 5/02, 7/06
U.S. Cl. 204—15 11 Claims



1. In a method for selectively electroplating a workpiece by a jet of plating solution, the steps comprising:

electroplating a selected region of said workpiece by impinging said jet on said selected region, and

concurrently providing a layer of fluid of low conductivity and in a predetermined fluid state on said workpiece adjacent to said selected region to mask said workpiece adjacent to said selected region from said electroplating solution, and wherein said fluid layer is further contiguous over said selected region in the absence of said impinging jet, and said jet pierces said layer to expose said region for said impinging and said electroplating.

4,409,072

METHOD OF COLLECTING LEAD FROM ASHES CONTAINING LEAD COMPOUNDS

Takeo Oki, Tsushima, and Isao Hiraki, Sakai, both of Japan, assignors to Osaka Lead Refinery Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 316,827, Oct. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 207,198, Nov. 14, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 439,820
Claims priority, application Japan, Apr. 21, 1979, 54-51032
Int. Cl.³ C25B 1/00; C25R 1/18
U.S. Cl. 204—57 1 Claim

1. A method of electrolytically collecting lead from ashes containing lead compounds, comprising:

adding the ashes to an aqueous solution containing 5 to 20 weight percent of caustic soda,

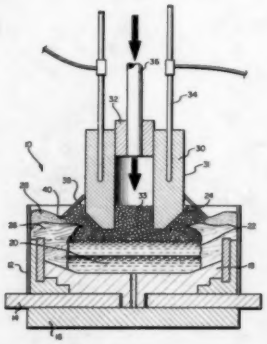
depositing lead at the cathode and lead peroxide at the anode by subjecting the solution to electrolysis in two stage, first at a current density of 120 to 200 mA/cm^2 without stirring the solution and then at a current density of 20 to 100 mA/cm^2 with stirring, the temperature being between room temperature and 80° C. in both stages, said cathode being a lead or iron plate not coated or coated with lead or a lead alloy and said anode being a lead or iron plate coated with lead or a lead alloy.

4,409,073

PROCESS FOR THE ELECTROLYTIC REDUCTION OF METALS AND AN IMPROVED PARTICULATE CARBON ELECTRODE FOR THE SAME

William M. Goldberger, Columbus, Ohio, assignor to Superior Graphite Co.

Filed Jun. 30, 1980, Ser. No. 164,803
Int. Cl.³ C25C 3/06, 3/12, 7/02
U.S. Cl. 204—67 20 Claims



1. An improved process for the electrolytic reduction of molten aluminum from an aluminum compound comprising the steps of:

providing a carbon cathode within a container;

dissolving the aluminum compound in a molten salt electrolyte solvent bath disposed within the container and in electrical contact with the cathode, said molten electrolyte having a higher decomposition potential than the aluminum compound, said molten bath having a lesser density than the reduced molten aluminum;

continuously providing a high purity and highly conductive, particulate, free-flowing, low density carbon material to said molten bath to serve as the anode, said carbon material having a lesser density than the molten bath to float thereon;

placing an electrical connection in contact with the particulate carbon anode;

applying electrical current thereto and collecting reduced molten aluminum at the cathode to form a pool; and

draining accumulated reduced molten aluminum from the pool thereof.

4,409,074

PROCESS FOR ELECTROLYSIS OF AN AQUEOUS ALKALI METAL CHLORIDE SOLUTION

Tokuzo Iijima, Kobe; Yasushi Samejima, Kakogawa; Toshiji Kano, and Yoshio Hatta, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1981, Ser. No. 256,569

Claims priority, application Japan, Jul. 28, 1980, 55-103804

Int. Cl.³ C25B *1/34, 1/46, 9/00*

U.S. Cl. 204—98 **9 Claims**

1. A process for electrolysis of an aqueous alkali metal chloride solution using a cation exchange membrane by which an electrolytic cell is partitioned into an anode compartment and a cathode compartment, which comprises effecting the electrolysis while utilizing impact resilience of springs positioned at anodes and exerting positive pressure on the cathode compartment.

4,409,075

METHOD FOR CUTTING A SEMICONDUCTOR CRYSTAL INTO WAFERS

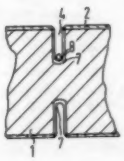
Bernd Kolbesen, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,374

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029792

Int. Cl.³ C25F *3/12;* **B23P** *1/10*

U.S. Cl. 204—129.3 **23 Claims**



1. An electrolytic-mechanical method of separating a semiconductor crystal, in particular a rod-like semiconductor crystal, into wafers, which comprises coating a semiconductor crystal with a masking layer of non-conducting material interrupted by stripes, immersing the semiconductor crystal with masking layer and stripes in an electrolyte provided with an electrode as a cathode and with the semiconductor crystal biased as an anode to form an electrolyzer, applying an electric current to the electrolyzer to produce oxide layers in the striped regions which are not masked by the masking layer, mechanically removing the oxide layers and separating the semiconductor crystal into a plurality of wafers, wherein a rod-like semiconductor crystal is used and the stripes interrupting the masking layer are arranged, parallel to each other and in ring-fashion, in planes approximately perpendicular to the longitudinal axis of the crystal.

4,409,076

INDIRECT ELECTROCHEMICAL FURAN SYNTHESIS

William C. Seidel, Hockessin, and Dimitri N. Staikos, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 10, 1982, Ser. No. 347,730

Int. Cl.³ C25B *3/02*

U.S. Cl. 204—130 **16 Claims**

1. Improved process for preparing a furan compound by oxidizing a diolefin in the presence of copper having an average oxidation state between 1 and 2, wherein the improvement comprises regenerating spent copper by electrolytic oxidation.

4,409,077

ULTRAVIOLET RADIATION CURABLE COATING COMPOSITION

Kazuo Sakiyama, Ibaraki; Mitsuo Kuwata, Osaka, and Masaru Oshiumi, Tokyo, all of Japan, assignors to Sumitomo Chemical Co., Ltd. and Sakata Shokai, Ltd., both of Osaka, Japan

Filed Oct. 19, 1978, Ser. No. 952,797

Claims priority, application Japan, Oct. 25, 1977, 52-128352; Oct. 25, 1977, 52-128353

Int. Cl.³ C08F *2/50;* **C08G** *12/44*

U.S. Cl. 204—159.15 **5 Claims**

1. A radiation curable resin composition which comprises (I) a photopolymerization initiator and (II) a radiation curable resin obtained by reaction of (A) an alkoxymethylated melamine selected from the group consisting of methoxymethylmelamines, ethoxymethylmelamines, butoxymethylmelamines, compounds in which different kinds of methoxymethyl, ethoxymethyl or butoxymethyl groups are held on the same melamine nucleus and polymers thereof, (B) an α,β-ethylenically unsaturated compound having at least one hydroxyl group selected from the group consisting of esters of alpha, beta-ethylenically unsaturated carboxylic acids with polyhydric alcohols, and reaction products obtained by reaction of epoxy compounds with hydroxyl group-containing (meth) acrylates, (meth) acrylic acids or itaconic acid and (C) at least one member selected from the group consisting of (1) polyols selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, dipropylene glycol, tripropylene glycol, tetrapropylene glycol, polypropylene glycols, 1,3-propanediol, 1,4-butanediol, 1,3-butanediol, 1,5-pentanediol, neopentyl glycol, 1,6-hexanediol, 1,8-octanediol, glycerin, trimethylolethane, trimethylolpropane, pentaerythritol, sorbitol and the etherification-condensed compounds of said polyols, bisphenols, hydrogenated bisphenols, halogenated bisphenols and resorcinol, (2) polyether polyols obtained by reaction of above-defined polyols with alkylene oxides, and (3) higher fatty acid esters having at least one hydroxyl group.

4,409,078

METHODS AND APPARATUS FOR ELECTROSTATICALLY RESOLVING EMULSIONS

John P. Wagner, Martinsville, and Edward C. Hsu, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 20, 1981, Ser. No. 255,871

Int. Cl.³ B03C *5/00*

U.S. Cl. 204—188 **6 Claims**

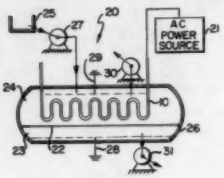
1. A method of electrostatically resolving emulsions containing solids dispersed in liquid into corresponding liquid and solid phases, comprising the steps of:

(a) placing a grounded electrode in an aqueous phase of said emulsion;

(b) placing a current-carrying electrode adjacent an interface of said liquid and solid phases, said current-carrying electrode having an inner support member for supporting an outer flexible plastic tube, said outer flexible plastic tube surrounding said inner support member and being concentrically spaced therefrom so as to provide a space therebetween, and an electrolyte disposed within said

space between said support member and said plastic tube; and

(c) passing an alternating current through said current-carrying electrode, said current having a frequency above 60 Hz and a voltage in an approximate range of from 2 to 100 kV, sufficient to effect the separation of said emulsion into said phases.



4,409,079

METHOD OF METALLIZING SINTERED CERAMICS

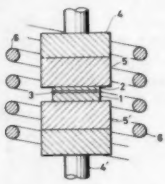
Kunio Miyazaki, Hitachi; Yukio Okosi, Mito; Akira Kumagai, and Hitoshi Suzuki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,499

Claims priority, application Japan, Jun. 24, 1981, 56-98986

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C 15 Claims



1. A method for metallizing a sintered ceramic containing a silicon compound which is reactable with manganese at a temperature lower than the melting point of manganese, which comprises forming a manganese-containing metal layer on a desired surface of the ceramic and heating the metal layer to a temperature lower than the melting point of manganese to effect the metallization reaction between silicon atoms of the silicon compound and manganese atoms, wherein prior to the reaction the metal layer is brought into an intimate contact with the surface of the ceramic in a manner that there is substantially no minute gap between the metal layer and the ceramic.

4,409,080

SYSTEM FOR MONITORING A CATHODICALLY PROTECTED STRUCTURE

Carlton M. Slough, Spring, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 18, 1981, Ser. No. 274,856

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—196 2 Claims

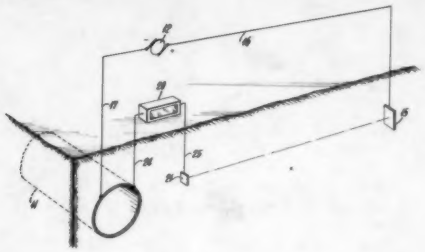
1. In a system having a buried structure being subject to galvanic corrosion,

said structure being under cathodic protection comprising an anode and a DC power supply connected between said structure and said anode for counteracting said galvanic corrosion,

means for monitoring the quantity of current flow between said anode and structure, comprising

a microcoulometer having a precision capillary tube with two columns of mercury separated by an indicating gap of electrolyte,

a target electrode having a predetermined relatively small surface area,



said target electrode being buried spaced from one to fifteen feet from said buried structure, and

a low resistance conductor connecting each of said two columns of mercury with one of said buried structure and said target electrode, respectively.

4,409,081

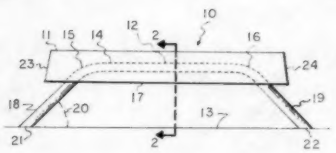
SACRIFICIAL ANODE

Leon J. Terrase, 6000 Brighton Pl., Algiers, La. 70114

Filed Feb. 5, 1982, Ser. No. 346,263

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—197 3 Claims



1. Sacrificial anode means comprising:

a. elongated sacrificial anode bar means; and

b. anode core means comprising an elongated member having a straight portion totally imbedded within said anode bar means and having curved end portions also embedded within said anode bar means, said curved end portions protruding from a side of said anode bar means and extending outwardly at an angle with respect to the straight portion of from 30° to 60°, and said curved end portions being mitred at their outer ends for attachment to a supporting structure for the galvanic protection thereof.

4,409,082

METHOD AND APPARATUS FOR THE GALVANIC DEPOSITION OF METAL ONTO OBJECTS, CLEANING OFF AND RECOVERY OF ADHERENT SURFACE TREATMENT AGENTS

Helmut Goldmann, Rannersdorf, Fed. Rep. of Germany, assignor to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,551

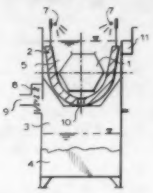
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3107101

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—213 17 Claims

1. Apparatus for the electrolytic deposition of metal onto metallic and appropriately pretreated non-metallic objects, and cleaning these objects of adhering surface treatment agents, as well as recovery of these agents, provided with treatment station, drum installation, anodes, work container, supply bin,

rotating arrangement, dosing and measuring arrangements, electrical attachments as well as connected conduit tubes, comprising two anodes semicircularly disposed around the drum installation in the work container with overflow arrange-



ment, with the work container connected to a supply bin across an opening with fractionating arrangement, which container and bin can be adjusted to a reduced pressure by means of a vacuum arrangement, and with the supply bin connected to the work container over a recirculation conduit.

4,409,083

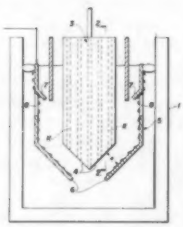
CELL WITH COMPOSITE ANODE FOR ELECTROLYTIC PRODUCTION OF MAGNESIUM

Gary V. Upperman, North Olmsted, Ohio, and James C. Withers, Tucson, Ariz., assignors to Metallurgical, Inc., Lakewood, Ohio

Continuation-in-part of Ser. No. 118,972, Feb. 6, 1980, Pat. No. 4,342,637, Ser. No. 944,987, Sep. 22, 1978, abandoned, Ser. No. 52,578, Jun. 27, 1979, abandoned, and Ser. No. 62,135, Jul. 30, 1979, Pat. No. 4,338,177. This application Dec. 22, 1981, Ser. No. 333,429

Int. Cl.³ C25C *3/04, 7/02, 7/04*

U.S. Cl. 204—245 **11 Claims**



6. An electrolytic cell for the production of a metal comprising in combination,

an electrolyte disposed in the cell, said electrolyte including ions selected from the group consisting of chlorides, fluorides or mixtures thereof,

a cathode immersed in the electrolyte presenting a surface for electrolyte winning of molten metal,

an anode body comprising a mixture of an oxygen containing compound of the metal and an electrically conductive reducing agent which mixture serves as a sole source of the metallic ore and is consummable in the electrolytic process,

said body having at least one active surface positioned in opposed relationship to but at all positions equally spaced from the surface of said cathode for providing an active anode surface at which the metallic oxide may be converted to metal ions recoverable as said molten metal at the opposing surface of said cathode,

longitudinally extending conductor means of higher electrically conductivity than said anodic mixture and being covered on at least one face thereof with said mixture,

said conductor means including at least one laterally extending branch thereof extending through said anodic mixture and having and end thereof positioned at least approximately adjacent said one active surface for providing short low resistant current paths from said one end through the mixture to said active surface, and

means for connecting a source of electrical power to said conductor means and said cathode whereby substantially the entire anodic current flows directly from said power source through said conductor means and at least the mixture adjacent the end of said conductor means and therefrom through the electrolyte to said active surface.

11. An electrolytic cell for the production of magnesium comprising in combination,

a housing having sidewalls and a bottom surface,

an electrolyte in the cell,

said electrolyte including ions selected from the group consisting of chlorides, fluorides or mixtures thereof,

a cathode immersed in the electrolyte presenting a surface for electrolytic winning of molten magnesium,

an anode comprising a particulate mixture of an oxygen containing compound of magnesium and an electrically conductive reducing agent, which mixture serves as a sole source of magnesium ore and is consumable in the electrolytic production of magnesium,

said mixture being immersed in the electrolyte beneath said cathode surface with the upper surface of said mixture providing an active anode surface,

a plurality of conductor means of higher electrically conductivity than said mixture projecting upward from the bottom surface of said cell,

said conductor means extending internally through said mixture with each having an end thereof positioned at least approximately adjacent said upper surface of said mixture, and

means for connecting a source of electrical power to said conductor means and said cathode.

4,409,084

ELECTROLYTIC CELL FOR ION EXCHANGE MEMBRANE METHOD

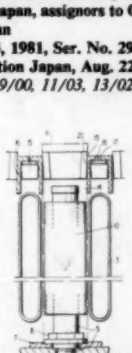
Kenzo Yamaguchi, Tokyo; Teruo Ichisaka, and Tadao Ikegami, both of Tamano, all of Japan, assignors to Chlorine Engineers Corp. Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,464

Claims priority, application Japan, Aug. 22, 1980, 55/114822

Int. Cl.³ C25B *9/00, 11/03, 13/02, 13/08*

U.S. Cl. 204—257 **7 Claims**



1. An electrolytic cell for the ion exchange membrane method, which comprises:

(a) an electrolytic cell main body;

(b) a lid member completely covering the electrolytic cell main body;

(c) a plurality of porous and hollow tubular cathodes disposed in the electrolytic cell main body;

(d) an electrolytic cell bottom plate having therein a plural-

ity of apertures through which an electrically conductive bar can be extended;

(e) a plurality of electrically conductive bars provided with a flange at a lower portion thereof, which are each inserted through the apertures of the electrolytic cell bottom plate into the interior of the electrolytic cell main body and secured to the electrolytic cell bottom plate by the flange;

(f) a plurality of porous anodes which are each connected to the electrically conductive bar and placed vertically in a face-face relation to the cathode, and which are disposed between the cathodes;

(g) a plurality of bag-shaped elements, at least the portions of which facing the anodes and the cathodes are formed by a cation exchange membrane, the bottom of which is provided with at least one aperture through which the electrically conductive bar can be extended, and which have each an open top; and

(h) a partition plate having therein a plurality of openings, which plate is provided on the top of the electrolytic cell main body,

wherein

one or more anodes are in the bag-shaped element,

the bottom of the bag-shaped element is secured to the electrolytic cell bottom plate together with the electrically conductive bar extending through the aperture of the bottom of the bag-shaped element by the flange of the electrically conductive bar so that an anode compartment is defined in the bag-shaped element, and

the opening of the top of the bag-shaped element is secured to the opening of the partition plate by a gasket and a gasket cap.

4,409,085

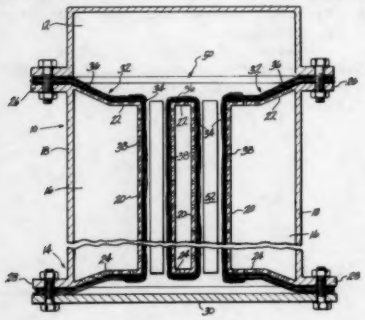
DIAPHRAGM CELLS EMPLOYING RETICULATE CATHODES

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 15, 1981, Ser. No. 330,637

Int. Cl.³ C25B *9/00, 11/03, 13/06*

U.S. Cl. 204—257 **10 Claims**



1. An electrolytic diaphragm cell for the electrolysis of an aqueous solution of an alkali metal chloride which comprises:

(a) a cell body;

(b) a porous diaphragm separating said cell body into an anode compartment and a cathode compartment;

(c) said anode compartment containing at least one anode;

(d) said cathode compartment containing at least one cathode, said cathode being comprised of a foraminous metal conductor and a reticulate cathode, said reticulate cathode being comprised of a network of electroconductive filaments having interfilament bonding formed by deposition of an electroconductive metal at contact sites between adjacent filaments, and having a porosity of at least 80 percent, said reticulate cathode being positioned between and in contact with said porous diaphragm and said foraminous metal conductor;

(e) means adapted to supply electric current to said anodes and said cathodes; and

(f) inlets and outlets in said cell body adapted to supply and remove fluids from said cell body.

4,409,086

ELECTROLYTIC CELL

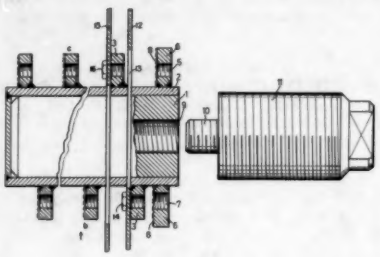
Günther Haas, Oberursel; Ludolf Plass, Kronberg, and Karl Lohrberg, Heusenstamm, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,710

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011643

Int. Cl.³ C25B *9/04, 11/10, 11/04*

U.S. Cl. 204—269 **8 Claims**



1. In an electrolytic apparatus comprising a cell chamber and means for passing an electrolyte therethrough, said cell provided with sets of anode plates, each of which is disposed between two sets of cathode plates and each of which is connected to a current-feeding center pin, said anode plates being mutually staggered electrode plates which protrude into the gaps between plates having the opposite polarity, the improvement wherein said center pin is provided with laterally disposed contact straps, which are spaced apart in the longitudinal direction of the pin, each of said straps having an anode plate secured thereto.

4,409,087

WAFER DETECTION CIRCUITRY FOR HIGH VACUUM USE

Donald L. Quick, Mountain View, Calif., assignor to The Perkin-Elmer Corp., Norwalk, Conn.

Filed May 18, 1982, Ser. No. 379,402

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **6 Claims**

1. In a sputtering system having wafers moving to and from a sputtering chamber, a detector located at a selected position for detecting the presence or absence of wafers at said position in their path of travel in said sputtering system comprising,

transducer means having a pair of sensor plates defining a fixed capacitance and located in the path of travel of said wafers,

current generating means for providing a constant current to said sensor plates which can be sensed as an output current signal from said sensor plates,

the sensor plates being positioned such that a wafer in close proximity thereto changes the output current of said sensor plates, and

current sensing means for sensing said output current and providing an output signal representative of said output current.

4,409,088

REGENERATION METHOD OF ION-SELECTIVE ELECTRODE, AND ION-SELECTIVE ELECTRODE AND ION-CONCENTRATION ANALYZER CONTAINING MEANS ADAPTED TO PRACTICE SAID METHOD

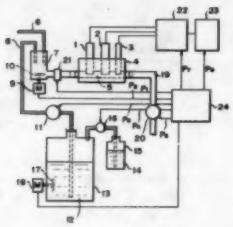
Ken-ichi Kanno, Tokyo; Tetsuya Gatayama, and Masao Koyama, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 23, 1982, Ser. No. 391,133

Claims priority, application Japan, Jun. 30, 1981, 56-100560; Jun. 30, 1981, 56-100561; Jun. 30, 1981, 56-100562; Jun. 30, 1981, 56-100564; Jun. 30, 1981, 56-100650

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—402 14 Claims



1. A method for regenerating an ion-selective electrode equipped with an ion-selective membrane which is formed of a high polymer membrane containing an ion-selective material and plasticizer, which method comprises supplying to the ion-selective membrane a regenerating plasticizer which is either identical in every aspects or analogous in effects to the first-mentioned plasticizer and is capable of dissolving the ion-selective material therein and imparting flexibility to the ion-selective membrane.

4. The method according to claim 1, wherein the regenerating plasticizer is supplied to the ion-selective membrane by dispersing in the ion-selective membrane a carrier containing the regenerating plasticizer in a concentration higher than the concentration of the plasticizer still remaining in the ion-selective membrane.

9. An ion-selective electrode for practicing the method of claim 4, equipped with a casing filled with an electrically conductive material, an ion-selective membrane attached to a free end portion of the casing, an inner reference electrode supported within the casing and a lead connected to the internal reference electrode, wherein the ion-selective membrane contains a polymer as its base material, the polymer contains in turn an ion-selective material and plasticizer as well as a carrier containing therein another plasticizer, and the latter plasticizer is present in a concentration higher than the former plasticizer.

4,409,089

COAL LIQUEFACTION AND RESID PROCESSING WITH LIGNIN

Leslie R. Rudnick, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 178,214, Aug. 14, 1980, Pat. No. 4,303,496. This application Nov. 30, 1981, Ser. No. 325,896

Int. Cl.³ C10G *1/00, 1/06, 47/00, 47/02*

U.S. Cl. 208—8 LE 13 Claims

1. A process for the liquefaction of coal comprising admixing the coal to be subjected to liquefaction with about 1.0% to about 4.0% of lignin based on the weight of the coal; introducing the mixture of coal and lignin to a dissolver wherein said mixture is subjected to temperature of about 600° F. to about 800° F. and pressure of about 50 to about 3000 psig for a period of time ranging from 0.5 to 180 minutes; and, separating light hydrocarbon fractions from a mixture of ash, undissolved coal, deashed coal and high quality coal extracts.

4,409,090

PROCESS FOR RECOVERING PRODUCTS FROM TAR SAND

Francis V. Hanson; Jan D. Miller, and Alex G. Oblad, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 155,257, Jun. 2, 1980, Pat. No. 4,337,143. This application Feb. 1, 1982, Ser. No. 344,324

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE 30 Claims

28. A process for recovering products from tar sand comprising the steps of:

obtaining a tar sand;

preparing a bitumen-rich concentrate from the tar sand using an alkaline, hot water separation process, said bitumen-rich concentrate comprising from about 35% bitumen and about 65% sand by weight to about 45% bitumen and about 55% sand by weight;

recovering products from the bitumen-rich concentrate by introducing the bitumen-rich concentrate into a fluidized bed while heating the bitumen-rich concentrate in the fluidized bed;

removing a coked sand from the fluidized bed, said coked sand comprising sand having a carbonaceous residue thereon;

recycling at least a portion of the coked sand to the alkaline, hot water separation process;

burning the carbonaceous residue on at least a portion of the coked sand to produce a hot burnt sand;

recycling at least a portion of the hot burnt sand to the bitumen-rich concentrate;

distilling the recovered products;

isolating a fraction formed during distillation within the temperature range of about 140° C. to about 370° C.; and

recycling the isolated fraction to the alkaline, hot water separation process.

4,409,091

ALKALI RECYCLE PROCESS FOR RECOVERY OF HEAVY OILS AND BITUMENS

Michael A. Kessick, Edmonton, Canada, assignor to Research Council of Alberta, Edmonton, Canada

Division of Ser. No. 157,935, Jun. 9, 1980. This application Mar. 3, 1982, Ser. No. 354,220

Claims priority, application United Kingdom, Jun. 8, 1979, 7919999

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE 11 Claims

1. A process for the recovery of bitumen from oil sands having bitumen associated therewith capable of emulsification with strong sodium hydroxide solution to form a stable oil-in-water emulsion, which comprises:

contacting said oil sand with water containing sodium hydroxide having a concentration of less than about 0.5 wt.% NaOH and in sufficient quantity to provide a pH of the water of at least about 11 so as to form an oil-in-water emulsion from the bitumen content of the oil sand, the amount of sodium hydroxide contacting said bitumen being about 0.05 to about 1.5 wt.% NaOH on bitumen,

separating said oil-in-water emulsion from solid phase sand remaining from said contacting step,

contacting said oil-in-water emulsion with about 0.02 to about 1 wt.% based on bitumen in said oil-in-water emulsion of slaked lime to effect inversion of said oil-in-water emulsion and to recover sodium hydroxide from the bitumen in said oil-in-water emulsion,

separating a water-in-oil emulsion resulting from said emulsion inversion from aqueous sodium hydroxide solution formed in said contacting step,

dewatering said water-in-oil emulsion to recover said bitumen therefrom,

dewatering a clay suspension formed in said oil-in-water emulsion contacting and said water-in-oil emulsion and separating steps to deposit clay particles therefrom and form a recycle aqueous sodium hydroxide stream, and

recycling said recycle aqueous sodium hydroxide stream to said oil sand contacting step to provide part of the water and sodium hydroxide utilized therein.

4,409,092

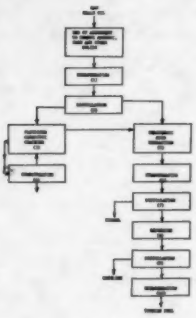
COMBINATION PROCESS FOR UPGRADING OIL PRODUCTS OF COAL, SHALE OIL AND CRUDE OIL TO PRODUCE JET FUELS, DIESEL FUELS AND GASOLINE

Charles A. Johnson, Ashland; Clifford Ward, Louisa; Howard F. Moore, Ashland, and Jr. Hettinger, Russell, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 138,237, Apr. 7, 1980, abandoned. This application Oct. 1, 1981, Ser. No. 307,468

Int. Cl.³ C10G *45/00*; B07B *1/06*

U.S. Cl. 208—89 **19 Claims**



1. A method for treating oil feeds to maximize the production of middle distillate fuels therefrom which comprises,

(a) hydrotreating an oil feed selected from shale oil, coal oil and crude oil comprising sulfur and nitrogen but separated from metal contaminants to remove sulfur and nitrogen therefrom and increase the ratio of basic nitrogen compound to total nitrogen compounds during hydrogen consumption within the range of about 50 to 1200 SCF/B of oil;

(b) distilling the product of step (a) into a first fraction providing an end boiling point in the range of about 600° F. to about 650° F. and a second higher boiling fraction;

(c) catalytically cracking said second higher boiling fraction of step (b) to produce a cracked product of end boiling point within the range of 600° to 650° F.;

(d) contacting said product fractions of steps (b) and (c) with an end boiling point within the range of 600° to 650° F. with an aqueous solution of phosphoric acid whereby basic nitrogen compounds in the oil products are extracted by the phosphoric acid solution;

(e) separating the phosphoric acid solution containing said extracted basic nitrogen compounds from a raffinate oil product,

(f) hydrotreating the raffinate oil product of step (e) to hydrogenate olefins, aromatics and nitrogen compounds therein employing hydrogen consumption conditions within the range recited for step (a),

(g) separating the hydrotreated product of step (f) to recover high boiling diesel fuel fraction from a fraction suitable for producing jet fuels,

(h) passing the fraction suitable for producing jet fuels separated in step (g) to catalytic reforming and recovering an oil product of catalytic reforming reduced in wax forming paraffins but comprising formed aromatics and olefins,

(i) separating gasoline product of said reforming step from higher boiling jet fuel boiling range product, and

(j) hydrotreating a reformed product comprising jet fuel boiling range material of step (i) sufficient to hydrogenate olefins and aromatics therein, and

(k) recovering a hydrogenated product of step (j) suitable for producing jet fuels.

4,409,093

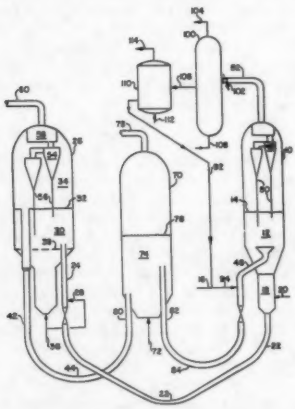
PROCESS FOR REDUCING COKE FORMATION IN HEAVY FEED CATALYTIC CRACKING

Roby Bearden, Jr., and Gordon Stuntz, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 260,191, May 4, 1981, Pat. No. 4,372,841, which is a continuation-in-part of Ser. No. 108,395, Dec. 31, 1979, Pat. No. 4,280,895. This application Jul. 22, 1981, Ser. No. 285,737

Int. Cl.³ C10G *9/16, 11/18*

U.S. Cl. 208—108 **14 Claims**



14. In a hydrocarbon cracking process of the type wherein:

A. hydrocarbon feedstock containing at least two metal contaminants selected from the class consisting of nickel, vanadium and iron is passed into a reaction zone having a cracking catalyst therein at cracking conditions to form cracked hydrocarbon products and wherein coke and metal contaminants are deposited on the catalyst;

B. coke and metal contaminated catalyst is passed from the reaction zone to a regeneration zone maintained under net reducing conditions having a regeneration gas passing therethrough to remove at least a portion of the coke from the catalyst, the improvement which comprises:

i. passing at least 10 weight % of the catalyst from the regeneration zone through a reduction zone maintained at a temperature within the range of about 600° C. to about 850° C. in the presence of hydrogen, carbon monoxide or mixtures thereof to at least partially passivate the metal contaminants on the catalyst; and

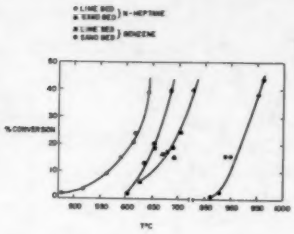
ii. passing the catalyst from the reduction zone to the reaction zone without further processing.

4,409,094

PROCESS FOR DETOXIFYING COAL TARS

John P. Longwell, Cambridge, and William A. Peters, Arlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 8, 1980, Ser. No. 176,580
Int. Cl.³ C10G 11/04
U.S. Cl. 208—121 11 Claims



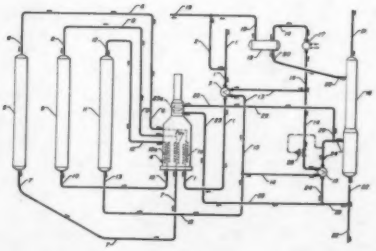
1. A process for treating hydrocarbon coal tar liquid containing toxic, mutagenic and/or carcinogenic aromatic compounds, said process comprising feeding said coal tar liquid into a reactor vessel, which is maintained at a temperature in the range of from about 400° C. to about 1000° C., where said coal tar liquid is present as a vapor and wherein said coal tar liquid is the only hydrocarbon fed into said reactor for treatment and no external hydrogen is added with the hydrocarbon feed, thermally treating said vapor in a reactor bed consisting essentially of a catalyst wherein said vapor is in intimate contact with said catalyst which consists essentially of calcium oxide or a calcium oxide-containing mineral, thereby removing at least some of said aromatic compounds and rendering said coal tar liquid less hazardous to the health of those handling it.

4,409,095

CATALYTIC REFORMING PROCESS

Kenneth D. Peters, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 222,469, Jan. 5, 1981, abandoned. This application Sep. 28, 1982, Ser. No. 426,017
Int. Cl.³ C10G 35/04
U.S. Cl. 208—134 5 Claims



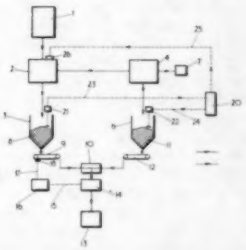
1. A catalytic reforming process comprising the steps of:
(a) heating a mixture of a hydrocarbonaceous feedstock and hydrogen in a radiant heating section of a fired heater and thereafter contacting the heated mixture with a reforming catalyst at reforming conditions to produce a reaction effluent;
(b) subjecting at least a portion of the reaction effluent to a first indirect heat exchange with a portion of a hereinafter specified hydrocarbon reformate;
(c) subjecting at least a portion of the reaction effluent to a second indirect heat exchange with said mixture of hydrocarbonaceous feedstock and hydrogen prior to the heating thereof in the fired heater;
(d) separating the reaction effluent into a hydrogen-rich vapor phase and a substantially liquid hydrocarbon phase and recycling at least a portion of said hydrogen-rich vapor phase for admixture with said hydrocarbonaceous feedstock;
(e) introducing said liquid phase into a stabilizer column, said column being maintained at fractionation conditions sufficient to provide an overhead fraction comprising hydrocarbons normally gaseous at standard temperature and pressure, and a bottom fraction comprising a hydrocarbon reformate;
(f) recovering and reheating a first predetermined amount of the hydrocarbon reformate by indirect heat exchange with hot combustion gases in a convection heating section of the fired heater of step (a) and returning the reheated reformate to the stabilizer column to supply a fixed quantity of heat to the column reboiler;
(g) recovering a second portion of the hydrocarbon reformate and subjecting it to indirect heat exchange with the reaction effluent as set forth in step (b) and returning the second portion to the stabilizer column to provide the balance of the reboiler heat requirement of the column; and,
(h) recovering a third portion of the hydrocarbon reformate as product.

4,409,096

CONTROL SYSTEMS FOR MATERIAL TREATMENT PLANT

Rodney W. O'Brian, Near Burton-on-Trent, England, assignor to Coal Industry (Patents) Ltd., London, England

Filed Jun. 15, 1981, Ser. No. 273,521
Claims priority, application United Kingdom, Jul. 15, 1980, 8023098
Int. Cl.³ B03B 7/00; G05D 11/02
U.S. Cl. 209—10 15 Claims

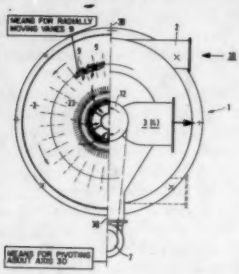


1. Material treatment plant comprising first material treatment means for producing a first treated fraction and a second treated fraction, operation of the first treatment means being controllable to vary one of the treated fractions relative to the other of the treated fractions, further material treatment means for further treating one of the said treated fractions produced by the first treatment means to produce a first further treated fraction and a second further treated fraction, separate storage means for the other of said treated fractions and for one of said further treated fractions, respectively, and a control system comprising sensor means for sensing the amounts of stored material in each of said separate storage means and for deriving signal means indicative of the sensed amounts of stored material, the control system further comprising control means for receiving said derived signal means and for controlling the operation of said first treatment means in accordance with the received signal means.

4,409,097
IMPROVED PIVOTABLE CENTRIFUGAL CLASSIFIER AND METHOD OF CLASSIFYING

Ulrich Barthelmess, Niederstotzingen, Fed. Rep. of Germany, assignor to OMYA GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,028
Int. Cl.³ B07B *7/083*
U.S. Cl. 209—11 **10 Claims**



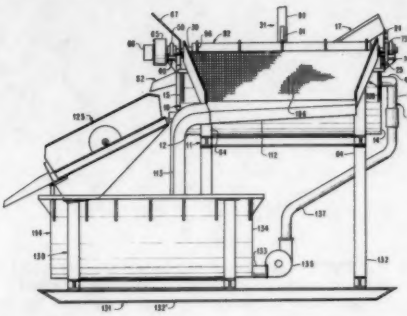
1. An improved centrifugal classifier, comprising:
a substantially cylindrical housing having an approximately tangential inlet for classifying air;
a vane ring arranged centrally within said housing and spaced radially inwardly from the casing thereof, said vane ring being of approximately the same axial length as said inlet for classifying air;
a classifying rotor arranged for rotation within and spaced radially inwardly from said vane ring, said rotor also being of approximately the same axial length as said inlet for classifying air and comprising a circumferentially and axially extending lamination ring defining radially extending passages leading from the outside diameter of said rotor to an axially extending interior volume in said rotor, said interior volume being open to flow of air and fine granular material passing from said radial passages and defining an inside diameter for said rotor;
an inlet for granular material to be classified, said inlet opening at one end of said classifier into a classifying area located between said vane ring and said lamination ring;
a first outlet for coarse granular material and air, said first outlet opening from said classifying area;
a second outlet for fine granular material and air, said second outlet being located adjacent said interior volume, the diameter of said second outlet corresponding approximately to said inside diameter of said rotor; and
means for pivoting said classifier about a horizontal axis, to vary the residence time of material in said classifying area and thereby vary the percentage of fine granular material removed from material to be classified.

4,409,098
APPARATUS FOR SEPARATING A MATERIAL OF LIGHTER SPECIFIC GRAVITY FROM A MATERIAL OF HEAVIER SPECIFIC GRAVITY

Billy T. Burke, Box 159, Thelma, Ky. 41260

Filed Mar. 29, 1982, Ser. No. 362,676
Int. Cl.³ B03B *5/40*
U.S. Cl. 209—172.5 **15 Claims**

1. An apparatus for separating a material of lighter specific gravity from a material of heavier specific gravity including:
a tank to receive the material to be separated;
said tank having an open upper end, a substantially semi-cylindrical bottom wall, and two end walls;
material introducing means to introduce the material to be separated into said tank through said open upper end at a selected angle;
medium introducing means to introduce a separating medium of a selected specific gravity under pressure into said tank in a substantially horizontal direction through one of said end walls;
the other of said end walls of said tank having opening means therein to control the level of the medium in said tank and to allow the separated material of lighter specific gravity to flow from said tank;
first baffle means extending from said one end wall for a selected distance;

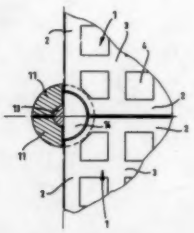


second baffle means extending from said other end wall for a selected distance so as to have its end spaced from the end of said first baffle means, said first baffle means having its exit aligned with the entrance of said second baffle means;
and rotary means to move along said substantially semi-cylindrical bottom wall of said tank to remove the material of heavier specific gravity therefrom.

4,409,099
SIEVE DECK FOR SIFTING MACHINES

Kurt Wolff, Bundesrepublik, Fed. Rep. of Germany, assignor to Steinhaus GmbH, Fed. Rep. of Germany

PCT No. PCT/DE80/00095, § 371 Date Mar. 2, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00065, PCT Pub. Date Jan. 22, 1981
PCT Filed Jul. 2, 1980, Ser. No. 243,964
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926987
Int. Cl.³ B07B *1/49*
U.S. Cl. 209—399 **5 Claims**



1. A sieve deck for sifting machines, sifting boxes or the like, comprising a support structure and sieve elements releasably disposed thereon and provided with a multiplicity of sieve openings which extend to form a continuous separation face and have the fundamental shape of a polygon, wherein the sieve elements are secured on the support structure at least in the vicinity of their secured corners and are connected with this support structure via spacer elements, whereby the adjoining corners of adjacent sieve elements are supported on one

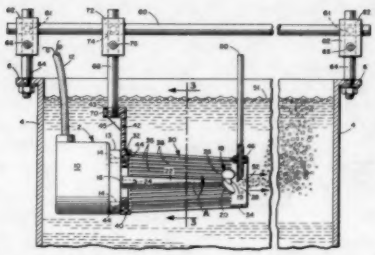
single spacer element, which has a single reception opening on its upper side for centrally securing all the adjacent corners of the respective sieve elements.

4,409,100

LIQUID AERATING DEVICE

Richard B. Rajendren, Belle Plaine, Minn., assignor to Aeration Industries, Inc., Chaska, Minn.

Filed Sep. 17, 1981, Ser. No. 303,019
Int. Cl.³ C02F *1/74;* B01F *3/04*
U.S. Cl. 210—219 **3 Claims**



1. A device for aerating liquids comprising:
a rotary drive motor;
an elongate drive shaft extending from and driven by said motor;
a propeller secured to said drive shaft adjacent its distal end, said propeller having one or more propeller blades configured so that the liquid is drawn into the propeller from a first side thereof and is ejected in a stream from the propeller on a second side thereof;
a hollow draft tube for aspirating air from above the surface of the liquid into the liquid;
an apertured support cage having a length extending between said motor and said propeller so that the entire distance between the motor and the cage is enclosed, said cage including means for supporting said motor at a first end thereof, means for holding said draft tube adjacent a second end thereof with the upper end of the draft tube above the upper level of the liquid and the lower end of the draft tube djacent the second side of said propeller, and apertures located substantially along its entire length and periphery whereby liquid is drawn to the first side of said propeller from an area extending substantially between said motor and sid propeller.

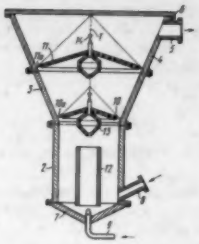
4,409,101

FLUIDIZED BED APPARATUS

Zufar G. Salikhov; Vasily A. Ivanov; Viktor P. Vyatchinov, all of Moscow; Vladimir I. Maltsev, UST-Kamenogorski; Sergei S. Grozdev, Moscow, and Nikolai V. Khodov, Ordzhonikidze, all of U.S.S.R., assignors to Moskousky Institut Stali I Splavov, Moscow, U.S.S.R.

Filed Nov. 16, 1981, Ser. No. 321,917
Int. Cl.³ B01D *53/12*
U.S. Cl. 210—266 **9 Claims**

1. A fluidized bed apparatus with a vertical longitudinal axis, comprising: a receptacle for coarser fractions associated with an inlet pipe for compressed gas and an inlet pipe for an initial product to be treated in a fluidized bed; a receptacle for medium fractions having an upwardly flaring frustoconical shape; a receptacle for fine fractions having and upwardly flaring frustoconical shape, associated with an outlet pipe for the treated product; said receptacle for coarser fractions, said receptacle for medium fractions and said receptacle for fine fractions being arranged along the certical longitudinal axis of said fluidized bed apparatus in fluid communication with one another; a grate extending transversely to the vertical longitudinal axis of said fluidized bed apparatus in said receptacle for fine fractions and being attached by means of resilient elements to walls of said receptacle for fine fractions; a source of compressed gas communicating with a respective inlet pipe; a source of the initial product communicating with a respective inlet pipe.

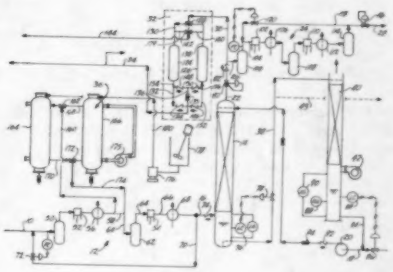


4,409,102

PROCESS FOR REMOVING CONTAMINANTS FROM A STREAM OF METHANE GAS

Milton R. Tanner, Whittier, Calif., assignor to Central Plants, Inc., Culver City, Calif.

Filed Nov. 27, 1981, Ser. No. 325,327
Int. Cl.³ C02F *11/04;* B01D *53/26*
U.S. Cl. 210—603 **14 Claims**



1. A process for removing contaminants of hydrogen sulfide and carbon dioxide from a low pressure, methane containing feed stream from an anaerobic process comprising:
(a) compressing the feed stream to an intermediate pressure;
(b) removing substantially all the hydrogen sulfide from the feed stream at the intermediate pressure;
(c) compressing the feed stream after the hydrogen sulfide removal step to an absorption pressure that is greater than the intermediate pressure;
(d) absorbing substantially all the carbon dioxide in the stream at the absorption pressure in water in an absorber to produce a treated gas stream;
(e) stripping the carbon dioxide from the water at a pressure lower than the absorption pressure; and
(f) recycling the water into the absorber to absorb further carbon dioxide.

12. A process for purifying a feed gas stream of methane, hydrogen sulfide and carbon dioxide by removal of the hydrogen sulfide and carbon dioxide, comprising the steps of:
(a) compressing the feed gas stream to an intermediate pressure;
(b) removing a substantial portion of the hydrogen sulfide from the feed gas stream at the intermediate pressure;
(c) compressing the feed gas stream after the hydrogen

sulfide removal step to an absorption pressure that is greater than the intermediate pressure;

(d) absorbing the carbon dioxide from the feed gas stream in an absorber at the absorber pressure in water from a water treatment facility to obtain a treated gas stream;

(e) passing the water with the absorbed hydrogen sulfide and carbon dioxide to the water treatment facility; and

(f) compressing the treated gas stream to a pressure suitable for introduction into high pressure storage tanks.

4,409,103

METHOD FOR THE PREPARATION OF CALCIUM HEPARINATE

Pietro Cremonesi, and Giancarlo Sportoletti, both of Milan, Italy, assignors to Italfarmaco S.p.A., Milan, Italy

Filed Aug. 11, 1980, Ser. No. 176,861

Claims priority, application Italy, Feb. 29, 1980, 20313 A/80

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—638 **4 Claims**

1. A process for the preparation of the calcium salt of heparin containing an amount of sodium by weight not in excess of 0.1% and containing an amount of calcium by weight not less than 9.5% which comprises subjecting a solution of sodium heparinate to ultrafiltration in the presence of a soluble calcium salt by means of a semi-permeable membrane which has a molecular nominal cut-off at less than 5000 Dalton, and wherein the fraction of the solution which has not gone through and which contains heparin is maintained at a constant concentration of heparin through continuous addition of a solution of calcium salt of concentration between 0.05 and 2 molar in calcium ions, and isolating said calcium heparinate with anticoagulant activity essentially equal to the anticoagulant activity of said sodium heparinate.

4,409,104

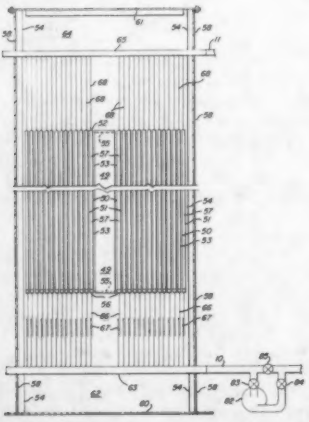
METHOD OF REGENERATING MOLECULAR SIEVE MATERIAL

Leonard E. Schroder; Leonard D. Schroder, both of Schroder Farms, Campo, Colo. 81029; and Billy D. Schroder, deceased, late of Campo, Colo., by Beverly Schroder, personal representative, Schroder Farms, Campo, Colo. 81029

Filed Mar. 30, 1981, Ser. No. 249,164

Int. Cl.³ B01J *20/34*

U.S. Cl. 210—673 **10 Claims**



1. A method of removing water from a normally liquid fluid by a molecular sieve material and regenerating said molecular sieve material, comprising:

placing said material within a series of first concentric, elongated, cylindrical spaces of limited thickness and separated by a series of second cylindrical spaces interposed between said first cylindrical spaces, with said second cylindrical spaces having a lesser thickness than the first cylindrical spaces;

passing said normally liquid fluid through said material while preventing any flow of said liquid fluid from said first cylindrical spaces into said second cylindrical spaces, until said molecular sieve material becomes sufficiently saturated with water that its ability to remove water is impaired;

passing a heated gas through said second cylindrical spaces while preventing any flow of said gas from said second cylindrical spaces to said first cylindrical spaces, in order to regenerate said molecular sieve material after passage of said normally liquid fluid is discontinued; and

similarly passing a cool gas through said second cylindrical spaces when sufficient water adsorbed by said molecular sieve material has been driven off to resume circulation of said normally liquid fluid through said molecular sieve material, in order to cool said molecular sieve material to a temperature permitting resumption of removal of water from said normally liquid fluid.

4,409,105

DRIED, STERILIZED, GAMMA-GLOBULIN-FIXED COLUMN AND A PROCESS FOR PREPARING THE SAME

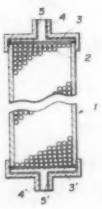
Hiroshi Hayashi; Takao Kiyota, both of Fuji, and Mitsuru Shibukawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1981, Ser. No. 323,338

Claims priority, application Japan, Dec. 18, 1980, 55-178110

Int. Cl.³ B01J *8/02*

U.S. Cl. 210—679 **12 Claims**



5. A process for preparing a dried, sterilized γ-globulin-fixed column which comprises subjecting carrier resin having γ-globulin borne thereby and fixed thereto to drying treatment and then to sterilization with ethylene oxide gas or propylene oxide gas.

4,409,106

APPARATUS AND METHOD FOR SEPARATING BLOOD COMPONENTS

Tadaaki Furuta, and Shuusaku Tabata, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1982, Ser. No. 369,439

Claims priority, application Japan, Sep. 8, 1981, 56-141216; Sep. 8, 1981, 56-141217; Nov. 26, 1981, 56-188320

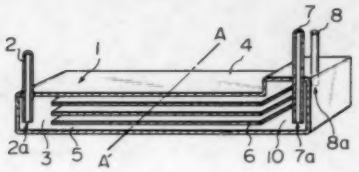
Int. Cl.³ B01D *21/01*

U.S. Cl. 210—732 **12 Claims**

9. A method for separating blood components by means of sedimentation action due to gravitational force, comprising the steps of:

continuously passing blood to be separated through a blood flow channel comprising at least two flat empty spaces having a thickness of not more than 20 mm, said blood

containing an added water-soluble polymer, while the blood flow channel is filled up;



separating the blood flow into multiple streams of the separated blood component layers; and

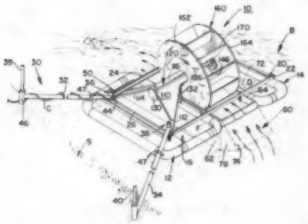
collecting the desired blood component layer or layers.

4,409,107

METHOD AND APPARATUS FOR AERATING BODIES OF WATER

Charles D. Busch, Rte. 3, Box 188, Lafayette, Ala. 36862, assignor to Charles D. Busch, Lafayette, Ala.

Filed Dec. 21, 1979, Ser. No. 106,266
Int. Cl.³ C02F *1/72, 7/00*
U.S. Cl. 210—758 **15 Claims**



13. A method of aerating a body of water such as a catfish pond, or the like, comprising the steps of:

using a paddlewheel, stirring water in a body of water near the surface of such water;

moving the stirring water from just below the surface of the water generally upward then moving that water in a generally horizontal direction at or near the surface so that oxygen-deficient deep water is moved to the surface to be mixed with oxygen-rich surface water while essentially no water is removed from the body of water; and

rotating the paddlewheel slowly enough so that water is stirred with essentially no splashing, bubbling or spraying.

4,409,108

LUBRICATING COMPOSITION FOR WELL FLUIDS

Leroy L. Carney, New Caney; Royal E. Loftin, Houston; Thomas E. Anderson, Houston, and Guillermo Vasquez, Houston, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 2, 1980, Ser. No. 155,885
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 C **12 Claims**

1. A composition for reducing the frictional resistance developed in an aqueous fluid between the surface of a moving metal article and an adjacent surface, said composition consisting essentially of:

an odor masking agent, a mixture of substantially equal amounts of glycerol monooleate and glycerol dioleate, and an alcohol or mixture of alcohols having 7 to 10 carbon atoms;

wherein the concentration of said odor masking agent in said composition is up to about 5 percent by weight of said composition, the concentration of said oleate mixture in said composition is in the range of from about 5 to about 60 percent by weight of said composition and the concentration of said alcohol in said composition is in the range of from about 10 to about 90 percent by weight of said composition.

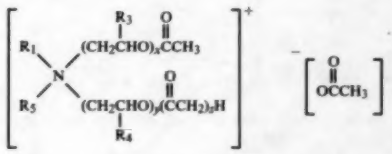
4,409,109

FABRIC SOFTENING COMPOUNDS AND METHOD

James M. Richmond, Naperville, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 54,341, Jul. 2, 1979, abandoned. This application Jul. 16, 1982, Ser. No. 399,035
Int. Cl.³ D06M *13/46*
U.S. Cl. 252—8.8 **3 Claims**

1. A solution comprising from about 50 to about 75 percent, by weight, of a compound of the formula



wherein R_1 is selected from the group consisting of alkyl and alkenyl groups containing from about 8 to about 22 carbon atoms, R_3 and R_4 are independently selected from the group consisting of hydrogen and methyl, R_5 is selected from the group consisting of hydrogen and alkyl and alkenyl groups containing from about 8 to about 22 carbon atoms, x and y are independently integers from 1 to about 20, and z is 0 or 1.

4,409,110

ENHANCED OIL DISPLACEMENT PROCESSES AND COMPOSITIONS

John K. Borchardt, and David L. Brown, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 6, 1981, Ser. No. 222,837
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **13 Claims**

1. A process of polymer augmented treatment of a porous, permeable subterranean formation subject to water flooding techniques in connection with the recovery of hydrocarbons comprising injecting into said formation via an injection well an aqueous mixture of at least two types of water soluble polymers wherein the first polymer is a nonionic synthetic water soluble aqueous fluid viscosifier having a molecular weight of about 0.5 million–30 million and the second polymer is a cationic organic polymer which contains cationic atoms of nitrogen, sulfur, phosphorus or combinations thereof wherein the polymer has a molecular weight of about 800–6,000,000 and is adsorbed by the formation leaving a viscous aqueous fluid containing said first viscosifying polymer and the remaining aqueous fluid has a higher viscosity than the aqueous fluid containing both polymers.

4,409,111

ANTI-GALLING LUBRICATIVE COMPOSITION

Mark Holmes, Quaker Hill, and Elliott Frauenglass, Newington, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Apr. 12, 1982, Ser. No. 367,695
Int. Cl.³ C10M *3/48, 3/22*
U.S. Cl. 252—30 **6 Claims**

1. A preapplied, lubricating composition consisting essentially of a dispersion or suspension of graphite powder or a metal powder selected from the group consisting of nickel, copper or aluminum, or any mixture of the foregoing, in an aqueous solution of a polymeric binder.

4,409,112

LUBRICANT, SLOW SPEED, HIGH LOAD

Charles W. Urmy, Jr., Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 23, 1981, Ser. No. 333,968
Int. Cl.³ C10M *1/10, 1/28*
U.S. Cl. 252—33.4 **19 Claims**

1. A heavy duty lubricating composition comprising a solution or mixture including:

a carrier fluid;

a metal lignosulfonate dissolved or dispersed therein;

an alkali metal fluoantimonite; and,

a nonionic homopolymer of ethylene oxide having a molecular weight of 400,000 to 5,000,000.

4,409,113

SYNTHETIC HOT FORGING LUBRICANTS AND PROCESS

Jerome W. Bertell, South Holland, Ill., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 2, 1981, Ser. No. 317,206
Int. Cl.³ C10M *3/18*
U.S. Cl. 252—42 **18 Claims**

1. A hot forging lubricant comprising an aqueous composition containing from about 0.5 to 35 percent by weight of composition of a dialkali metal salt of a phthalic acid and from about 0.005 to 25.0 percent by weight of composition of a thickening agent.

9. A hot forming lubricant comprising an aqueous composition containing conventional aqueous lubricant additives, the improvement comprising including in the composition from about 0.5 to 35 percent by weight of composition of a dialkali metal salt of a phthalic acid and from about 0.005 to 25.0 percent by weight of composition of a thickening agent.

16. A hot forging process for metals comprising applying to hot forging dies an aqueous lubricant composition containing from about 0.1 to 35 percent by weight of composition of a dialkali metal salt of a phthalic acid and from about 0.005 to 25.0 percent by weight of composition of a thickening agent, placing the metal between the dies, closing the dies under pressure, opening the dies and removing the forged metal.

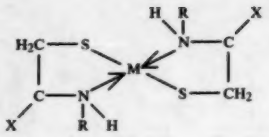
4,409,114

HYDROGEN SULFIDE SUPPRESSANT ADDITIVE FOR FUNCTIONAL FLUIDS

Stanley J. Brois, Westfield; Antonio Gutierrez, Mercerville, and Jack Ryer, East Brunswick, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 4, 1982, Ser. No. 405,266
Int. Cl.³ C10M *3/32, 3/48*
U.S. Cl. 252—75 **10 Claims**

1. A functional fluid composition comprising a major amount of a synthetic or mineral oil of lubricating viscosity containing an oil-soluble additive in an amount effective to suppress the tendency of the fluid composition at elevated temperatures to form hydrogen sulfide, the additive being a compound of the formula



wherein R is a C_{10}–C_{24} alkyl, M is a metal of the group of zinc, iron, copper, nickel, molybdenum and chromium and X is $—H_2$ or $=O$.

4,409,115

ETCHING SOLUTION FOR ETCHING OF PHOTOPOLYMERIC FILMS

Manfred A. J. Sondergeld, Mulheim, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sep. 20, 1982, Ser. No. 420,480
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150637
Int. Cl.³ C09K *13/02*
U.S. Cl. 252—79.1 **4 Claims**

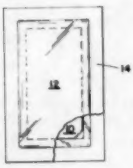
1. An etching solution for dot etching photopolymerized materials which comprise an organic polymeric binder having alkali soluble groups, a polymer of an ethylenically unsaturated monomeric compound, and a photoinitiator or photoinitiator system, the photopolymerized material having an optical density in the actinic region of the spectrum of at least 1.0, the improvement wherein the etching solution contains as the etching agent a water-soluble salt of a water-insoluble polymeric polycarboxylic acid whose acid strength is the same or less than that of the organic polymeric binder present in the photopolymerized material.

4,409,116

WINDSHIELD WIPER CLEANING PRODUCT

Richard Lodico, 20 Track Rd., Reading, Mass. 01867

Filed Aug. 18, 1982, Ser. No. 409,330
Int. Cl.³ C11D *17/00*
U.S. Cl. 252—91 **6 Claims**



1. A product for cleaning windshield wiper blades comprising a single use packaged cleansing unit comprising a sheet of liquid absorbant material impregnated with a windshield wiper cleaning liquid,

said sheet of material being enclosed in a sealed, tearable, gas-tight envelope,

said windshield wiper cleaning liquid comprising

an aqueous solution of ammonium hydroxide which has a concentration between 0.1 N and 3 N, said ammonium hydroxide solution comprising between 10% and 50% of said liquid, by volume,

acetone, said acetone comprising between 30% and 80% of said liquid, by volume, and

an alcohol having between one and five carbon atoms, inclusive, said alcohol comprising between 2% and 50% of said liquid, by volume.

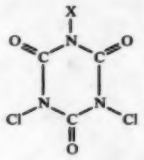
4,409,117

DETERGENT COMPOSITIONS STABLE TO CHLORINE SEPARATION, AND AGENTS FOR PRODUCING SAME

Krister Holmberg, Mölndal, and Ingvar Nilsson, Kungälv, both of Sweden, assignors to EKA AB, Surte, Sweden

Filed Dec. 17, 1980, Ser. No. 217,527
Int. Cl.³ C11D 3/395, 7/26, 7/56, 17/06
U.S. Cl. 252—99 8 Claims

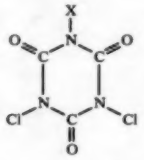
1. A detergent composition comprising alkali metal phosphate, alkali metal silicate, a surfactant, a chlorinated triazine trione of the formula



(I)

wherein X is Cl, Na or K, or when X is Na, the dihydrate thereof, and optionally conventional additives, characterized in that the chlorinated triazine trione of formula (I) is in the form of granules having a particle size of from 0.5 to 5 mm., said granules being coated with a hydrophobic layer consisting essentially of a thin layer of a diester selected from the group consisting of the diester of phthalic acid or adipinic acid with an alcohol having 4–18 carbon atoms, said diester being employed in an amount of 3–9% by weight, calculated on the amount of the chlorinated triazine trione of formula (I).

6. An agent for producing a detergent composition, characterized in that the agent comprises granules of chlorinated triazine trione of the formula



(I)

wherein X is Cl, Na or K, or the dihydrate of the triazine trione of formula (I) when X is Na, said granules having a particle size of from 0.5–5 mm., said granules being coated with a thin hydrophobic layer of a diester selected from the group consisting of the diester of phthalic acid or adipinic acid with an alcohol having 4–18 carbon atoms, said diester being employed in an amount of 3–9% by weight, calculated on the amount of the chlorinated triazine trione of formula (I).

4,409,118

TABLET FORMING CLEANSER COMPOSITION AND METHOD OF PREPARATION

Anthony B. J. Eoga, Boonton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 297,892, Aug. 31, 1981, Pat. No. 4,362,639, which is a continuation-in-part of Ser. No. 251,030, Apr. 3, 1981. This application May 20, 1982, Ser. No. 380,157
Int. Cl.³ C11D 7/14, 7/16, 7/18, 7/30
U.S. Cl. 252—99 37 Claims

1. An effervescent cleansing composition in tablet form comprising:

A. a phosphate salt in an amount of from about 20% to about 45% by weight;

B. a silicate salt in an amount of up to about 20% by weight; and

C. at least one perborate salt in an amount of at least 50% by weight:

wherein at least a portion of said perborate salt is present in a compacted, granulated mixture in an amount effective to facilitate compaction without substantially sticking to tablet forming equipment and with suitable dimensional stability without prolonged disintegration time when placed in solution, said granulated mixture containing from about 0.01% to about 0.70% by weight of said granulated mixture of a polymeric fluorocarbon.

4,409,119

PROCESS FOR REGENERATING CLEANING SOLUTIONS

Helga Bürger, Erkrath, and Christian Rossmann, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,289
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137340
Int. Cl.³ C11D 7/02, 7/14
U.S. Cl. 252—156 8 Claims

1. A process for regenerating an alkaline or neutral aqueous degreasing and cleaning solution containing at least 1 g/l of a phosphate or a silicate, or a mixture thereof, and wherein said solution is contaminated with emulsified mineral oil, natural oil, or a mixture thereof, comprising adding to said contaminated solution either (1) from about 0.3 to about 2 g/l of calcium ions, (2) from about 0.2 to about 1.2 g/l of magnesium ions, or (3) a mixture of calcium ions and magnesium ions chemically equivalent to from about 0.3 to about 2 g/l of calcium ions.

4,409,120

PROCESS FOR FORMING OIL-SOLUBLE PRODUCT

Michael K. Martin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 332,692, Dec. 21, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,191
Int. Cl.³ C08F 8/04
U.S. Cl. 525—280 11 Claims

1. A process for preparing an oil-soluble, star-shaped product, said process comprising:

a. solution polymerizing one or more conjugated diene monomers and optionally one or more monoalkenyl arene monomers under polymerization conditions at a temperature between about −75° C. to +150° C. with an organomonolithium compound, therein forming living polymeric arms;

b. contacting said living polymeric arms with a polyalkenyl aromatic coupling agent at a temperature between about 0° C. and about +150° C., therein forming a coupled polymer having a poly(polyalkenyl aromatic) nucleus and attached polymeric arms;

c. contacting said coupled polymer with a nitrogen containing polar compound monomer therein attaching poly(nitrogen containing polar compound) arms to said nucleus; and

d. contacting the resulting polymer with a reactant selected from the group consisting of hydrazine and p-toluenesulfonylhydrazide at a temperature between about 50° C. and about 150° C., therein forming N_2H_2, which reduces by hydrogenation at least about 80% of the aliphatic unsaturation of said polymeric arms.

4,409,121

CORROSION INHIBITORS

Edwin J. Latos, Chicago, and John C. Payne, Glendale Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 170,375, Jul. 21, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 392,869

Int. Cl.[3] C23F *11/16, 11/14, 11/12, 11/18*

U.S. Cl. 252—389 A 10 Claims

1. Composition for the prevention of corrosion comprising a mixture of a phosphate compound, a salt of a metal selected from the group consisting of molybdenum, tungsten and chromium, a phosphonate compound selected from the group consisting of nitrilotris(methylene)triphosphonic acid and 1-hydroxyethylidene-1,1-diphosphonic acid, and an aryl triazole.

4,409,122

CATALYST REACTIVATION

Engelina C. Kleuskens, Stein; Johannes G. H. Maessen, Roermond, and Theodorus J. van de Mond, Geleen, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jan. 27, 1982, Ser. No. 343,362

Claims priority, application Netherlands, Jan. 27, 1981, 8100364

Int. Cl.[3] B01J *27/30;* C07C *120/14, 121/32;* B01J *27/02*

U.S. Cl. 502—20 8 Claims

1. A process for the reactivation of a spent oxidic catalyst, which is suitable for oxidation, ammoxidation and/or oxidative dehydrogenation of olefines, which catalyst contains a tellurium oxide and as principal active components antimony and/or iron oxides, said process consisting essentially in mixing the spent catalyst with a solid particulate tellurium compound or with a particulate, solid carrier material containing a tellurium compound, in an amount sufficient to raise the tellurium content, calculated as metal, of the reactivated catalyst to a value between 90% and 500% by weight of the tellurium content of the original, fresh catalyst.

2. Process according to claim 1, wherein said oxidic catalyst is on a solid particulate carrier material.

3. Process according to claim 1, wherein said value is from 90% to 200%.

4,409,123

SULFUR SORBENT REGENERATION PROCESS

William C. Hecker, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1982, Ser. No. 362,755

Int. Cl.[3] B01J *23/94, 23/92;* C10G *29/16, 29/04*

U.S. Cl. 502—38 7 Claims

1. A process for regenerating a spent copper-inorganic porous carrier composite sorbent for removing thiol compounds from hydrocarbons comprising:

(a) contacting the spent sorbent with an oxidizing gas at a temperature in the range of 300° C. to 700° C. and for a time sufficient to convert the sulfur in the sorbent to a sulfate form; and

(b) purging the oxidized sorbent with a nonreducing inert gas at an elevated temperature of at least about 500° C. and for a time sufficient to convert substantially all of said sulfate form to sulfur dioxide whereby the sulfur content of the sorbent is reduced substantially, said elevated temperature being below that which would cause a deleterious change in the sorbent, said purging with an inert gas being performed after step (a) without an intervening step in which the oxidized sorbent is contacted with a reducing gas.

6. The process of claim 1 wherein the inert gas is nitrogen.

7. The process of claim 1 wherein the temperature of step(a) is in the range of about 450° C. to about 650° C., the inert gas is nitrogen, the elevated temperature is in the range of about 550° C. to 700° C., and the sulfur content is reduced to below about one percent by weight.

4,409,124

PROCESS FOR REGENERATING SULFUR SORBENT BY OXIDATION AND LEACHING

Richard C. Robinson, San Rafael, and William C. Hecker, Albany, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1982, Ser. No. 362,754

Int. Cl.[3] B01J *23/94, 23/92;* C10G *29/16, 29/04*

U.S. Cl. 502—5 7 Claims

1. A process for regenerating a spent copper-inorganic porous carrier composite sorbent for removing thiol compounds from hydrocarbons in which the copper component of the sorbent constitutes about 5% to 50% by weight of copper calculated as copper metal comprising:

(a) contacting the spent sorbent with an oxidizing gas at a temperature of 350° C. to 700° C. for a time sufficient to convert the sulfur in the sorbent to a sulfate form; and

(b) directly after step (a) contacting the oxidized sorbent with a liquid solvent for said sulfate form whereby a substantial portion of said sulfate form is extracted from the oxidized sorbent by the solvent.

4,409,125

PROCESS FOR PRODUCING ACTIVATED FIBROUS CARBON

Hiroshi Nishino, Osaka; Masayuki Suzuki, Kyoto, and Hideo Hirota, Sennan, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP79/00160, § 371 Date Feb. 22, 1980, § 102(e) Date Jul. 2, 1979

PCT Filed Jun. 22, 1979, Ser. No. 266,012

Claims priority, application Japan, Jun. 22, 1978, 53/76039; Jul. 10, 1978, 53/84231

Int. Cl.[3] C01B *31/12;* B01J *20/20;* D01F *9/12*

U.S. Cl. 502—180 3 Claims

1. A process for producing activated fibrous carbon, which comprises carbonizing vegetable fibers in the presence of at least one member selected from the group consisting of ammonium salts of inorganic acids, nitric acid and boric acid and then activating the carbonized material, in the presence of 30 to 200 parts by weight of zinc chloride on the basis of 100 parts by weight of the carbonized material, in an atmosphere of nitrogen gas or a combustion gas from heavy oil, light oil or kerosene, at 350° C. to 750° C. for 0.25 to 2 hours.

2. A process as claimed in claim 1, wherein the carbonization temperature is at about 250° to 450° C.

3. A process as claimed in claim 1 wherein the ammonium salt of inorganic acid is ammonium chloride.

4,409,126

ULTRA HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Randall S. Shipley, Alvin, and Donald F. Birkelbach, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 22, 1981, Ser. No. 313,868

Int. Cl.[3] C08F *4/64*

U.S. Cl. 502—169 10 Claims

1. A hydrocarbon soluble reaction product or complex formed from the admixture at a temperature and time sufficient to provide a color change of

(a) at least one transition metal compound represented by the empirical formulae $Tm(OR)_yX_{x-y}$ or $Tm(OR)_{x-2}O$ wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; each X is independently a halogen; x has a value equal to the valence of Tm and y has a value from 1 to the valence of Tm; and

(b) at least one organometal compound represented by the empirical formula MR_xX_y; wherein M is a metal selected from magnesium, aluminum, boron, lithium or mixtures thereof; R is an alkyl group having from 1 to about 20 carbon atoms; X is a halogen, x has a value of from 1 to the valence of metal M; the value of x+y is equal to the valence of M; the quantities of (a) and (b) employed being that which provides a ratio of Q:Tm of from about 0.1:1 to about 2:1; and wherein Q has a value corresponding to the value of x divided by the valence of M times the number of moles of MR_xX_y.

4,409,127
ATTRITION RESISTANT METAL/OXYGEN COMPOSITIONS AND A PROCESS FOR THEIR PREPARATION

Robert A. Keppel, Seabrook, Tex.; Samuel J. Tremont, Manchester, Mo.; Emerson H. Lee, and George D. Davis, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1981, Ser. No. 335,785
Int. Cl.³ B01J *21/04, 23/14, 23/18, 23/84*
U.S. Cl. 502—205 **41 Claims**

1. An attrition resistant metal/oxygen composition which comprises the infusion and reaction product of:

(a) 35 to 80 mole percent of an alumina existing in a crystal form selected from the group consisting of γ, δ, η, and χ crystal forms, and mixtures thereof, or that can be transformed by heat to such crystal forms, and characterized by

(i) a mean particle size from about 10 μm to about 200 μm,

(ii) a fractional porosity of at least 0.2,

(iii) a surface area of at least 150 m^2/g, and

(iv) a pore diameter such that at least 10 percent of the pores are less than 55 A, and

(b) 20 to 65 mole percent of at least one metal oxide, or compound convertible by heat to such metal oxide, having a maximum mean particle size of about 100 μm, with the proviso that the alumina/metal oxide mean particle size ratio is at least 2, which metal oxide is susceptible of undergoing infusion and reaction with the alumina upon being subjected to temperatures of at least 0.4 T_m for a time sufficient to cause infusion and reaction between the metal oxide and the alumina, wherein T_m is the melting point in °K. of the alumina wherein the composition is represented by the empirical formula selected from the group consisting of $Pb_{10}Sb_3Bi_2O_x(Al_2O_3)_{7\text{-}28}$, $Bi_{15\text{-}30}K_{4\text{-}5}Zr_{1\text{-}2}O_x(Al_2O_3)_{16\text{-}29}$, $(PbO_x)_3(Al_2O_3)_4$, $Pb_5BiO_x(Al_2O_3)_{18}$, $Pb_{10}Sb_3Bi_2KO_x(Al_2O_3)_{19}$, $Bi_{15}Ca_5ZrO_x(Al_2O_3)_{16}$, $Bi_5Fe_5Ca_5BO_x(Al_2O_3)_8$, and $Bi_2Fe_2Ca_2O_x(Al_2O_3)_3$.

4,409,128
OXIDATION CATALYST, ESPECIALLY FOR THE PREPARATION OF METHACRYLIC ACID BY GAS PHASE OXIDATION OF METHACROLEIN

Richard Krabetz, Kirchheim; Franz Merger, Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,633
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030243
Int. Cl.³ B01J *27/14*
U.S. Cl. 502—211 **1 Claim**

1. An oxidation catalyst wherein the catalytically active component has the general formula

$$Mo_{12}P_aRh_bCu_cV_dCs_eX_fY_gZ_hO_x,$$

where X is Cr and/or Fe, Y is Nb, Z is Na, Li, K and/or Rb, a is 0.1–4, b is 0.001–1, c is 0.05–2, d is 0.05–4, e is 0.1–5, f is 0–2, g is 0–3 and h is 0–2, and x is the number of oxygen atoms required to saturate the valencies of the other constituents.

4,409,129
METHOD OF MANUFACTURING CATALYST

Seizi Takeuchi, Hitachiota, and Shimpei Matsuda, Tokai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP81/00044, § 371 Date Oct. 19, 1981, § 102(e) Date Oct. 19, 1981, PCT Pub. No. WO81/02532, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 4, 1981, Ser. No. 314,051
Claims priority, application Japan, Mar. 5, 1980, 55-26689
Int. Cl.³ B01J *21/18, 23/42, 23/44, 23/46*
U.S. Cl. 502—185 **8 Claims**

1. A method of manufacturing a catalyst supported by a carrier, which comprises the step of reducing a solution containing a platinum ion and at least one metal ion having an oxidation-reduction potential different from that of platinum to precipitate metal particles onto a carrier and the step of dissolving out particles of the at least metal having an oxidation-reduction potential different from that of platinum from the precipitated metal particles obtained by the reduction to form a catalyst supported by said carrier; the metal ion having an oxidation-reduction potential different from that of platinum being a metal ion having a reduction potential lower than that of platinum.

4,409,130
PROCESS FOR IMPROVING THE STABILITY OF CATALYSTS FOR THE CATALYTIC HYDROTREATMENT OF PETROLEUM CUTS

Jacques Bousquet, 2 Rue de la Carriere, 69540 Irigny; Claude Gueguen, Le Cayet, 38780 Septeme Pont l'Eveque, and Daniel Vautier, 28 Rue des Fleurs, 69360 Serezin du Rhone, all of France

Division of Ser. No. 258,321, Apr. 28, 1981, Pat. No. 4,363,719. This application Jan. 28, 1982, Ser. No. 343,454
Claims priority, application France, May 8, 1980, 80 10307
Int. Cl.³ B01J *21/12*
U.S. Cl. 502—211 **7 Claims**

1. A process for preparing a catalyst composition which comprises 5–90% of a catalyst containing a metal from each of Group VI and Group VIII of the Periodic Table on a non-acid or weak acid oxide support and 95-10% of a catalyst containing a metal from each of Group VI and Group VIII of the Periodic Table on a silica-alumina support having a silica content greater than 5% by weight, said process comprising forming said first catalyst by impregnating said non-acid or weak acid oxide support with said metal, calcining said impregnated catalyst and sulfurizing said calcined catalyst, forming said second catalyst by impregnating said silica-alumina support with said metal, calcining said second impregnated catalyst and sulfurizing said second calcined catalyst, and combining said first and second catalyst.

4. The catalyst composition of claim 1 wherein said metal is selected from the group consisting of cobalt, nickel and molybdenum.

4,409,131
PREPARATION OF COMO AND NIMO CATALYST USING COBALT OR NICKEL COMPLEXES THAT ARE STABLE IN BASIC SOLUTION

John A. Fetchin, Stamford, Conn., assignor to Maine, Stamford, Conn.

Filed Feb. 22, 1982, Ser. No. 350,676
Int. Cl.³ B01J *21/12, 23/85, 21/04*
U.S. Cl. 502—263 **9 Claims**

1. A stable, basic impregnating solution comprising a basic molybdate salt and a basic salt of an anionic complex of cobalt or nickel complexed with a carboxylic acid selected from acetic acid, tartaric acid, succinic acid and citric acid in amounts to provide at least three available proton sites per

cobalt or nickel atom in said complex, both of said salts being dissolved in a single basic aqueous solution.

5. A method of making a catalyst comprising cobalt or nickel and molybdenum on catalyst support, said method comprising impregnating a porous catalyst support with a solution defined by claim 1 and then drying and calcining the impregnated support.

9. A catalyst made by the method defined by claim 5 wherein the catalyst support is porous alumina, or silica alumina.

4,409,132
ORGANOPHOSPHORUS-TREATED ZEOLITE CATALYSTS FOR PARA-SELECTIVE AROMATICS CONVERSION

Nancy P. Forbus, Princeton, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,560
Int. Cl.³ B01J *29/06, 27/18*
U.S. Cl. 502—62 11 Claims

1. A method for treating a chemically modified zeolite catalyst useful for promoting the para-selective conversion of aromatic compounds to dialkyl substituted benzene materials, said catalyst comprising both a crystalline zeolite material having a constraint index within the approximate range of 1 to 12 and a silica/alumina mole ratio of at least 12 and a minor proportion of one or more difficultly reducible oxides, said method comprising contacting said catalyst with a vapor phase organophosphorus reagent selected from C_{1-4} alkyl phosphite esters and C_{1-4} alkyl phosphate esters, at a temperature of 100° C. to 300° C. and for a period of time and under conditions sufficient to either enhance para-selectivity of said catalyst or to reduce the susceptibility of said catalyst to deselectivation by contact with moisture.

3. A method according to claim 1 wherein the difficultly reducible oxide is magnesium oxide and the organophosphorus reagent is selected from $(R_1O)(R_2O)(R_3O)P$ and $(R_1O)(R_2O)(R_3O)P{=}O$, wherein R_1, R_2 and R_3 are each lower alkyl containing 1 to 4 carbon atoms.

10. A catalyst composition prepared in accordance with the method of claim 1, 2, 3, 4, 5, 6, 7, 8 or 9.

4,409,133
ATTRITION RESISTANT BISMUTH-CONTAINING METAL/OXYGEN COMPOSITIONS AND A PROCESS FOR THEIR PREPARATION

Samuel J. Tremont, Manchester, Mo.; Robert A. Keppel, Seabrook, Tex.; Emerson H. Lee, and George D. Davis, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1981, Ser. No. 335,786
Int. Cl.³ B01J *21/04, 23/18*
U.S. Cl. 502—354 29 Claims

1. An attrition resistant bismuth-containing metal/oxygen composition which comprises the infusion and reaction product of:

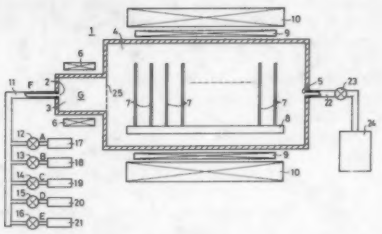
(a) 35 to 80 mole percent of an alumina existing in a crystal form selected from the group consisting of γ, δ, η, and χ crystal forms, and mixtures thereof, or that can be transformed by heat to such crystal forms, and characterized by
  (i) a mean particle size from about 10 μm to about 200 μm,
  (ii) a fractional porosity of at least 0.2,
  (iii) a surface area of at least 150 m^2/g, and
  (iv) a pore diameter such that at least 10 percent of the pores are less than 55 Å, and

(b) 20 to 65 mole percent of at least one bismuth oxide, or compound convertible by heat to such bismuth oxide, having a maximum mean particle size of about 100 μm, with the proviso that the alumina/bismuth oxide mean particle size ratio is at least 2, which bismuth oxide is susceptible of undergoing infusion and reaction with the alumina upon being subjected to temperatures of at least 0.4 T_m for a time sufficient to cause infusion and reaction between the bismuth oxide and the alumina, wherein T_m is the melting point in °K. of the alumina which composition exhibits a surface area of less than 5 m^2/g.

4,409,134
PHOTOELECTRIC CONVERSION SEMICONDUCTOR AND MANUFACTURING METHOD THEREOF

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Filed Feb. 24, 1981, Ser. No. 237,609
Claims priority, application Japan, Mar. 3, 1980, 55-26388
Int. Cl.³ H01C *13/00*
U.S. Cl. 252—501.1 3 Claims

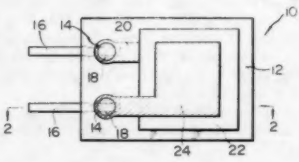


1. A photoelectric conversion semiconductor which is formed of a mixture of a microcrystalline semiconductor and a non-crystalline semiconductor and in which the mixture is doped with a dangling bond neutralizer and the microcrystalline semiconductor has a lattice strain; the microcrystalline semiconductor is 5 to 200 A in particle size and dispersed in the non-crystalline semiconductor; the dangling bond neutralizer is hydrogen, chlorine or fluorine; the microcrystalline semiconductor and the non-crystalline semiconductor are each formed by silicon, germanium, Si_3N_{4-x} $(0<x<4)$, SiC_x $(0<x<1)$, $Si_xGe_{1-x}(0<x<1)$, GaAs, BP or InP.

4,409,135
PASTE CONTAINING ELECTRICALLY CONDUCTING POWDER TO FORM CONDUCTING SOLID FILLER IN CAVITY IN CERAMIC SUBSTRATE

Yoshio Akimune, Yokohama, and Satoshi Ambe, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 26, 1981, Ser. No. 247,943
Claims priority, application Japan, Apr. 25, 1980, 55-54254
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—514 12 Claims



1. A paste for forming an electrically conducting solid filler for a cavity in a substrate comprised of a ceramic material, of a device having at least two electrically conducting parts separately fixed to the substrate such that the solid filler provides an electrical connection between the conducting parts, the paste comprising:

an electrically conducting powder mixture comprising a

platinum powder and a ceramic material powder selected from the group consisting of an alumina powder and a zirconia powder, the proportion of said platinum powder to said ceramic material powder being in the range from 51:49 to 78:22 by volume, the specific surface area of said powder mixture being in the range from 1.0 to 10.0 m^2/g; and

an organic liquid vehicle, the proportion of said powder mixture to said vehicle being in the range from 70:30 to 50:50 by weight.

4,409,136

MOLECULAR SIEVE ZEOLITE-BUILT DETERGENT PASTE

Bao-ding Cheng, Kendall Park, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 764,145, Jan. 31, 1977, abandoned, which is a continuation of Ser. No. 503,745, Sep. 6, 1974, abandoned. This application Apr. 23, 1982, Ser. No. 371,261

Int. Cl.³ C02F *1/42;* **C11D** *1/83, 3/12, 17/08*

U.S. Cl. 252—540 **1 Claim**

1. A stable, homogeneous paste detergent comprising:

(a) about 24% of a synthetic nonionic detergent formed by the condensation of a linear C_{12}–C_{15} primary alcohol with about 7 ethylene oxide residues;

(b) about 8% of sodium silicate having an $Na_2O:SiO_2$ ratio of about 1:2.35;

(c) about 24% by weight based on the anhydrous weight of a type A zeolite having a moisture content of about 21% and an average particle diameter of 6.4 microns;

(d) about 0.2% of sodium carboxymethyl cellulose;

(e) about 34.7% of deionized water; and

(f) about 9.1% of linear sodium dodecyl benzene sulfonate.

4,409,137

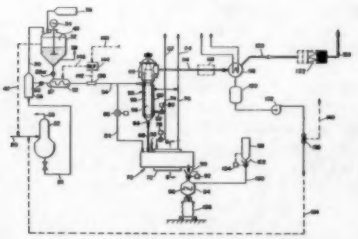
SOLIDIFICATION OF RADIOACTIVE WASTE EFFLUENTS

Leo M. Mergan, Uccle, and Jean-Pierre Cordier, Braine-Le-Comte, both of Belgium, assignors to Belgonucleaire, Brussels

Continuation-in-part of Ser. No. 138,796, Apr. 9, 1980, abandoned, Continuation-in-part of Ser. No. 194,102, Oct. 6, 1980, abandoned. This application Mar. 25, 1981, Ser. No. 247,446

Int. Cl.³ C09K *3/00, 11/04*

U.S. Cl. 252—632 **45 Claims**



1. A process for enveloping a radioactive waste liquid containing solids, said process comprising the steps of:

chemically treating said waste liquid by adding at least one chemical reagent to adjust the pH of said liquid to greater than 7.0;

concentrating said solids using a thin-film evaporator having a heated wall and means for distributing said waste liquid as a film on said wall to remove a portion of the moisture from said waste liquid and form a liquid concentrate containing a greater concentration of solids than in said waste liquid;

drying said concentrate in a mixing apparatus having a heated wall and rotor means for contacting said heated wall with said concentrate to remove the remaining liquid from said waste and form a solid waste residue, said rotor means including mixing means for shearing said solid waste residue so as to form dry particles and advancing means for engaging said dry particle to positively advance said dry particles toward an outlet of said mixing apparatus; and,

enveloping said dry particles of waste material in a second material.

40. An apparatus for enveloping radioactive waste liquid containing solids comprising:

means for treating said waste with at least one chemical reagent to adjust the pH of said liquid to greater than 7.0;

thin-film evaporator means for concentrating said waste liquid, said thin-film evaporator means having a heated wall and rotor means for distributing said waste liquid as a thin-film on said wall so as to evaporate moisture from said waste and form a liquid concentrate containing a greater concentration of solids than in said waste liquid;

a heated mixing apparatus having a heated wall for drying said concentrate and rotor means for contacting said heated wall with said concentrate to remove the remaining liquid from said waste and form a solid waste residue, said rotor means including a plurality of mixing paddles for shearing said solid waste residue between said paddles and said heated wall and between different paddles so as to form dry particles, and advancing means for engaging said dry particles to positively advance said dry particles toward an outlet of said mixing apparatus;

means for discharging said concentrate from said thin-film evaporator to said mixing apparatus;

means for causing said waste liquid to pass through said thin-film evaporator and said concentrate to be discharged to said mixing apparatus so that the concentrate received by said mixing apparatus contains at least 30 weight percent moisture; and,

means for enveloping said dry particles of waste solids in a second material.

4,409,138

NON-ABSORBABLE COMPOUNDS OF MUCOLYTIC ACTIVITY, THE PROCESS FOR THEIR PREPARATION, AND THERAPEUTIC COMPOSITIONS WHICH CONTAIN THEM AS ACTIVE PRINCIPLE

Javier E. Maltz, Buenos Aires, Argentina, assignor to Etablissement Texcontor, Vaduz, Liechtenstein

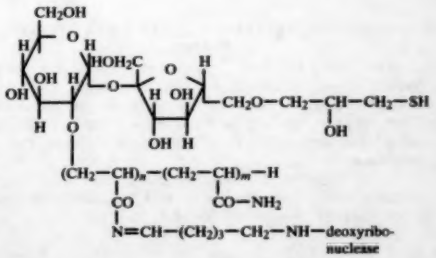
Filed Sep. 5, 1980, Ser. No. 184,249

Claims priority, application Italy, Jul. 1, 1980, 23161 A/80

Int. Cl.³ C07G *7/00;* **C08B** *37/00;* **A61K** *37/02*

U.S. Cl. 260—112 R **2 Claims**

1. A compound having mucolytic activity while not being absorbed by tissues of the formula



wherein n+m is 500.

4,409,139

GONADOSTATIN

Nicholas C. Ling, San Diego; Roger C. L. Guillemin, La Jolla; Shao-Yao Ying, San Diego, and Frederick S. Esch, Oceanside, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Aug. 10, 1981, Ser. No. 291,294
Int. Cl.³ C07G *15/00*
U.S. Cl. 260—112 R 5 Claims

1. A method of deriving substantially pure gonadostatin, a proteinaceous mammalian gonadal substance characterized by its selective inhibition of LRF-stimulated pituitary secretions of LH and FSH in dosages below a threshold level and general stimulation of pituitary hormone secretion in dosages above a threshold level, the method comprising:

obtaining a mammalian gonadal secretion;

initially separating the components of said secretion according to molecular weight by gel filtration and obtaining a partially purified material containing eluate fractions which deomonstrate gonadostatin activity;

further separating components of said partially purified material by partition chromatography with a two-phase 1-butanol, pyridine, acetic acid, water eluent system to obtain further purified material; and

additionally purifying said further purified material by reverse phase high performance liquid chromatography with a formic acid, pyridine, 1-propanol, water eluent system of increasing 1-propanol concentration to obtain a substantially purified substance which demonstrates activity in inhibiting the LRF-stimulated secretion of LH and FSH by the pituitary.

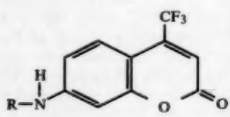
4,409,140

SUBSTRATES AND METHOD FOR DETERMINING ENZYMES

Robert E. Smith, 574 Escondido Cir., Livermore, Calif. 94550, and Eugene R. Bissell, 101 Via Lucia, Alamo, Calif. 94507

Division of Ser. No. 32,444, Apr. 23, 1979, Pat. No. 4,294,923. This application Jun. 15, 1981, Ser. No. 273,518
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 9 Claims

1. A proteolytic enzyme substrate of the formula



wherein R is an amino acid, a peptide, an amino acid which has been reacted with a blocking group, or a peptide, the terminal amino acid of which has been reacted with a blocking group; and R is releaseable therefrom by enzymatic hydrolysis to form a measureable amount of 7-amino-4-trifluoromethylcoumarin.

4,409,141

PEPTIDES FOR ASSAYING HUMAN PARATHYROID HORMONE

Toshiharu Noda, Houston, Tex.; Kaoru Morita, Shizuoka; Sadami Kobari, Mishima; Nobuaki Nakagawa, Shizuoka; Susumu Watanabe, Shizuoka; Shigeo Katsuragi, Shizuoka; Kunio Ohyama, Shizuoka, and Masahiko Taniuchi, Mishima, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 29, 1981, Ser. No. 335,401
Claims priority, application Japan, Dec. 29, 1980, 55-187686; Apr. 16, 1981, 56-057691; Sep. 25, 1981, 56-152377
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A peptide of the formula

R—Lys—Lys—Glu—Asp—Asn—Val—Leu—Val—Glu—Ser—His—Glu—Lys—Ser—Leu—Gly—Glu—Ala—Asp—Lys—Ala—Asp—Val—Asp—Val—Leu—Thr—Lys—Ala—Lys—Ser—Gln—Oh [I]

wherein R is H, H—Tyr— or R_1—Pro—Arg—, R_1 is H, H—Tyr— or R_2—Ala—Gly—Ser—Gln—Arg—, and R_2 is H, H—Cys— or H—Tyr—, or a salt thereof.

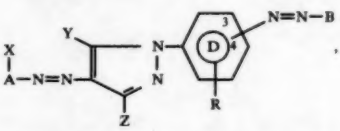
4,409,142

DISAZO COMPOUNDS HAVING A 5-AMINO OR HYDROXY-3-CARBOXY OR METHYL-1-SUBSTITUTED PHENYLPHYRAZOLE COUPLING COMPONENT RADICAL

Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 144,380, Apr. 28, 1980, Pat. No. 4,374,064. This application Apr. 13, 1981, Ser. No. 253,684
Claims priority, application Switzerland, May 2, 1979, 4117/79
Int. Cl.³ C09B *31/06, 31/10, 31/14*
U.S. Cl. 260—160 28 Claims

1. A disazo compound of the formula



(I)

or a salt thereof each cation of which is non-chromophoric, wherein

A-X is the radical of a diazo component,

wherein X is a metallizable group or a substituent convertible to a metallizable group, with the proviso that X is ortho to the —N=N— radical,

B is the radical of a coupling component of the heterocyclic series or the non-cyclic active methylene radical-containing series, with the proviso that the —N=N—B group is in the 3- or 4-position of Ring D,

R is hydrogen, halo, methyl or sulfo,

Y is —OH or —NH_2, and

Z is methyl or carboxy,

wherein each halo is independently fluoro, chloro, bromo or iodo, with the provisos that (i) the disazo compound contains at least one water-solubilizing group in addition to any water-solubilizing group as X or Y and (ii) the disazo compound may be in salt form only if it contains at least one sulfo or carboxy group.

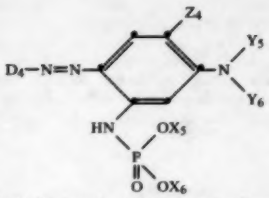
4,409,143

MONOAZO DYES CONTAINING PHOSPHAMIC ACID DIESTER GROUPS

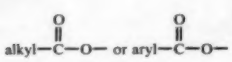
John Lenoir, and Gerald Jan, both of Fribourg, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 28, 1981, Ser. No. 258,245
Claims priority, application Switzerland, Apr. 30, 1980, 3341/80
Int. Cl.³ C09B *29/085, 29/09, 29/26;* G03C *1/10*
U.S. Cl. 260—205 8 Claims

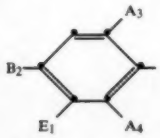
1. An azo dye of the formula



in which X_5 and X_6 independently of one another are alkyl having 1 to 12 carbon atoms, which is unsubstituted or substituted by hydroxyl, methoxy, ethoxy, cyano, fluorine, chlorine or bromine, or are phenyl or benzyl, Y_5 is hydrogen or alkyl having 1 to 5 carbon atoms which is unsubstituted or substituted by alkoxy having 1 to 4 carbon atoms, Y_6 is hydrogen or alkyl having 1 to 8 carbon atoms which is unsubstituted or substituted by methoxy, phenyl, hydroxyl, fluorine, chlorine, bromine, carbalkoxy having 2 to 6 carbon atoms, a radical of the formula



where the alkyl moiety contains 1 to 6 carbon atoms and the aryl moiety is phenyl which is unsubstituted or substituted by chlorine, bromine, cyano or nitro, or cyano or is phenyl which is unsubstituted or substituted by alkyl or alkoxy each having 1 to 5 carbon atoms, or by chlorine, or Y_5 together with Y_6 stands for the atoms required to complete a pyrrolidine ring which is unsubstituted or substituted by carbalkoxy having 2 to 5 carbon atoms, Z_4 is hydrogen, alkyl or alkoxy each having 1 to 4 carbon atoms, or alkoxy having 1 or 2 carbon atoms which is substituted by methoxy or ethoxy, or Z_4 is chlorine, bromine, cyano or carbalkoxy having 2 to 5 carbon atoms, or stands for the atoms which together with Y_5 form a methyl-substituted piperidine ring, D_4 is thiaziazolyl which is unsubstituted or substituted by chlorine or phenyl or imidazolyl which is unsubstituted or substituted by cyano, and in which at least one of the nitrogen atoms is unsubstituted or substituted by $—C_2H_4OC_6H_5$, or is benzthiazolyl or benzisothiazolyl which are both unsubstituted or substituted by nitro groups, or thienyl which is unsubstituted or substituted by methyl or carbethoxy or methyl and carbethoxy, or is a radical of the formula



in which A_3 and A_4 independently of one another are hydrogen, alkyl having 1 to 4 carbon atoms, carbalkoxy having 2 to 5 carbon atoms, carbalkoxyethoxy having 1 to 4 carbon atoms in the alkoxy moiety, trifluoromethyl, cyano, nitro, alkylsulfone having 1 to 5 carbon atoms or halogen, B_2 is hydrogen or alkyl having 1 to 4 carbon atoms which are unsubstituted or substituted by cyano, nitro, chlorine, trifluoromethyl, bromine, acetyl, benzoyl, carbmethoxy, carbethoxy, methoxy, ethoxy or cyano- or carbethoxy- or cyano- and carbethoxy substituted vinyl, or is alkoxy having 1 or 2 carbon atoms or is alkenyl having 2 to 4 carbon atoms which are unsubstituted or substituted by cyano, nitro, chlorine, trifluoromethyl, bromine, acetyl, benzoyl, carbmethoxy, carbethoxy, methoxy, ethoxy or cyano- or carbethoxy- or cyano- and carbethoxy-substituted vinyl, or is $T_2—CO—$, in which T_2 is methyl or phenyl, or B_2 is carbalkoxy having 2 to 5 carbon atoms, alkylsulfone having 1 to 6 carbon atoms, phenylsulfone, N-alkyl-substituted or N,N-dialkyl-substituted sulfonamido, in which each alkyl moiety has 1 or 2 carbon atoms and is unsubstituted or methoxy-substituted, cyano, nitro or halogen, and E_1 is hydrogen, alkyl having 1 to 4 carbon atoms or cyano, nitro, chlorine, trifluoromethyl, bromine, acetyl, benzoyl, carbmethoxy, carbethoxy, methoxy, ethoxy or cyano- or carbethoxy- or cyano- and carbethoxy-substituted vinyl, or stands for the atoms which together with B_2 form a propylene or imido group, in which the nitrogen atom is alkoxyalkyl-substituted, the alkoxy and alkyl moieties each having 1 to 4 carbon atoms.

4,409,144

XERONINE, A NEW ALKALOID, USEFUL IN MEDICAL, FOOD AND INDUSTRIAL FIELDS

Ralph M. Heinicke, Honolulu, Hi., assignor to Research Corporation of the University of Hawaii, Honolulu, Hi.

Continuation-in-part of Ser. No. 870,919, Jan. 19, 1978, abandoned. This application Dec. 11, 1981, Ser. No. 329,953

Int. Cl.[3] **C07G** *17/00;* **C07C** *103/52;* **A61K** *37/48;* **C12N** *9/48, 9/50*

U.S. Cl. 260—236.5 **17 Claims**

1. A new composition of matter called xeronine formed by the process comprising obtaining source materials selected from the group consisting of plant, bacteria and animal alkaloid producing lipophilic extracts, combining lysozymes with the extracts to produce a mixture, controlling the concentration level of free calcium ions in the mixture to produce an optimum concentration level which activates the lysozymes, and controlling the pH of the mixture to the range of about 3.5–5.0 to react the extracts with the activated lysozymes to produce the active substance xeronine.

4,409,145

PROCESS FOR PREPARING 4-PHENYL-1,3-BENZODIAZEPINES

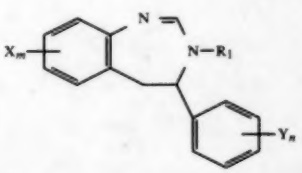
Lawrence L. Martin, Lebanon, N.J.; Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, and Charles A. Crichlow, Piscataway, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 91,062, Nov. 5, 1979, Pat. No. 4,309,424, which is a continuation-in-part of Ser. No. 948,896, Oct. 5, 1978, abandoned. This application Sep. 8, 1981, Ser. No. 299,867

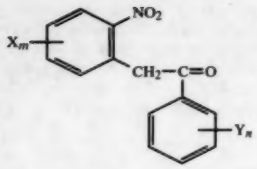
Int. Cl.[3] **C07D** *243/03*

U.S. Cl. 260—239 BD **2 Claims**

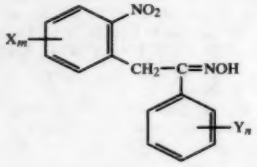
1. A method for preparing a compound of the formula



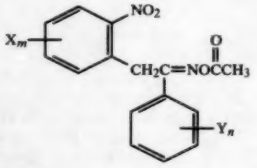
in which R_1 is hydrogen, alkyl of from 1 to 5 carbon atoms, cycloalkylalkyl of from 4 to 8 carbon atoms or aralkyl having from 1 to 5 carbons in the alkyl moiety, and the aryl moiety of the aralkyl group being phenyl or phenyl substituted with one or more chloro, bromo, fluoro, methoxy, alkyl of 1 to 5 carbon atoms, hydroxy or trifluoromethyl groups, X and Y are the same or different and each can be hydrogen, chlorine, bromine, fluorine, methoxy, alkyl of from 1 to 3 carbon atoms, hydroxy, or trifluoromethyl; m is the integer 1 or 2; n is the integer 1, 2 or 3; and the optical antipodes thereof; or a physiologically acceptable salt thereof, which comprises converting an acetophenone of the formula



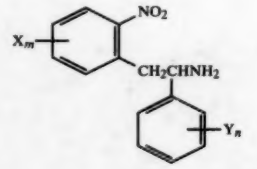
to the corresponding oxime of the formula



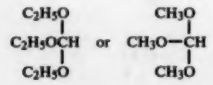
esterifying said oxime with acetic anhydride to provide the corresponding acetate of the formula



reducing said acetate with a reducing agent which is compatible with the nitro group to provide the corresponding 2-nitro-α-phenylphenethylamine of the formula



reducing said 2-nitro-α-phenylphenethylamine to provide the corresponding 2-amino-α-phenylphenethylamine; and cyclizing said 2-amino-α-phenylphenethylamine with a compound of the formula



in the presence of an acid catalyst at a temperature of from about 25° C. to reflux of the reaction mixture.

4,409,146

SUBSTITUTED CAPROLACTAM DERIVATIVES AS ANTIHYPERTENSIVES

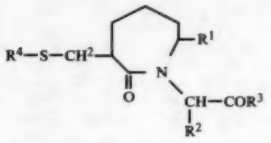
Eugene D. Thorsett, Fanwood, and Elbert E. Harris, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 294,863, Aug. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,692, Oct. 6, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,972

Int. Cl.³ C07D *223/10*

U.S. Cl. 260—239.3 R **8 Claims**

1. A compound of the formula:



I

wherein:

R^1 is hydrogen, loweralkyl, unsubstituted cycloalkyl having 3 to 10 carbon atoms, amino loweralkyl, alkylamino loweralkyl, hydroxyalkyl, dialkylamino loweralkyl, arloweralkyl, aryl, substituted aryl wherein the substituent is halo, alkyl, aminoalkyl, or alkoxy;

R^2 is hydrogen or loweralkyl;

R^3 is hydroxyl, loweralkoxy, or aralkyloxy;

R^4 is hydrogen or loweralkanoyl; and,

the pharmaceutically acceptable salts thereof: wherein in said R^1, R^2, R^3 and R^4 groups, said alkyl groups have 1 to 12 carbon atoms; said loweralkyl groups have 1 to 8 carbon atoms; said aryl and said ar prefix denote unsubstituted aromatic ring(s) having 6 to 12 carbon atoms.

4,409,147

CARBAPENEM COMPOUNDS AND THEIR PRODUCTION

Mitsuko Asai, Takatsuki; Susumu Shinagawa, Higashiosaka, and Akira Imada, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

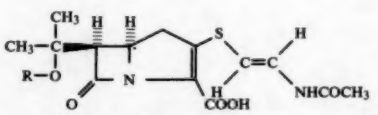
Filed Feb. 20, 1981, Ser. No. 236,310

Claims priority, application Japan, Mar. 10, 1980, 55-30701; Mar. 10, 1980, 55-30702

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.2 T **2 Claims**

1. A compound of the formula:



wherein R is —SO_3H, or a physiologically acceptable salt thereof.

4,409,148

PROCESS FOR THE REDUCTION OF UNSATURATED CARBOXYLIC ACIDS

Gail M. Qualeatti, Palatine, and Dalia Germanas, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 9, 1981, Ser. No. 329,356

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ C11C *3/12*

U.S. Cl. 260—409 **12 Claims**

1. A process for the reduction of an unsaturated carboxylic acid which comprises treating said acid in a reaction system in

the presence of hydrogen and a reducing catalyst system comprising from about 0.1 to about 2.0 percent by weight rhenium composited on a solid support and from about 1.0% to about 5.0% by weight of said catalyst of a phosphorous-containing modifier selected from the group consisting of phosphorous acids and phosphorous salts at treatment conditions, and recovering the resultant unsaturated alcohol, ester or alcohol and ester reaction product.

4,409,149

PROCESS FOR PRODUCING CATALYST PRECURSORS

Ernst Billig, Charleston, and David R. Bryant, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1981, Ser. No. 278,897

Int. Cl.³ C07F 15/00

U.S. Cl. 260—429 R **16 Claims**

1. A process for preparing rhodium (I) carbonyltriorganophosphorus mono-β-ketoenolate complexes which comprises reacting (a) a halocarbonylbis(triorganophosphorus) rhodium (I) complex, (b) a β-ketoenolate source, and (c) an oxygen transfer agent, wherein the amount of β-ketoenolate source employed is at least one mole equivalent per mole equivalent of the halocarbonylbis(triorganophosphorus) rhodium (I) complex and wherein the oxygen transfer agent is present in a quantity equal to or exceeding one mole equivalent per mole equivalent of the halocarbonylbis(triorganophosphorus) rhodium (I) complex.

4,409,150

PREPARATION OF CYANOBENZYL CYCLOPROPANE CARBOXYLATES

Derek A. Wood, Sittingbourne, England, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

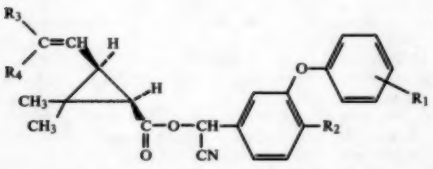
Filed May 7, 1982, Ser. No. 375,998

Claims priority, application United Kingdom, May 26, 1981, 8116033

Int. Cl.³ C07C 121/75

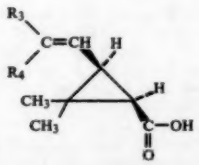
U.S. Cl. 260—465 D **6 Claims**

1. A method for preparing a pyrethroid insecticide of general formula:



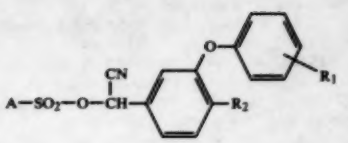
(I)

wherein the two hydrogen atoms on the cyclopropane ring are in the cis-configuration, characterised in that an acid of formula



(II)

is neutralised with a water-soluble base and then reacted in the presence of a phase-transfer catalyst with a solution in a substantially water-immiscible organic solvent of an alpha-cyanobenzyl aryl sulphonate of formula:



(III)

the substituents in the formulae having the following meanings; A represents an optionally substituted aryl group; each of R_1 and R_2 independently represents a hydrogen or halogen atom; and each of R_3 and R_4 independently represents a chlorine or bromine atom or a methyl group.

4,409,151

N,N-DIMETHYLENE PHOSPHONIC ACIDS OF ALKYLENE DIAMINES

Derek Redmore, Webster Groves, and William S. Paley, Maryland Heights, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 201,866, Oct. 29, 1980, Pat. No. 4,330,487. This application Dec. 28, 1981, Ser. No. 334,847

Int. Cl.³ C07F 9/38

U.S. Cl. 260—502.5 E **3 Claims**

1. A process of preparing an N,N-dimethylene phosphonic acid of the formula

$$NH_2(CH_2)_nN(CH_2PO_3H_2)_2$$

where n=2–20, which comprises reacting in aqueous solution one mole of a diamine of the formula

$$NH_2(CH_2)_nNH_2$$

where n has the aforesaid value, with essentially two equivalents each, based on nitrogen-bonded hydrogen, of formaldehyde and phosphorous acid, at a pH of less than 2 and a temperature from 80° to 150° C., the formaldehyde and phosphorous acid being added in either order or together to the diamine.

4,409,152

CONTINUOUS HIGH PRESSURE PROCESS FOR PREPARING PHENYLPHOSPHONOUS DICHLORIDE

Lawrence F. Humphrey, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 30, 1981, Ser. No. 307,034

Int. Cl.³ C07F 9/48

U.S. Cl. 260—543 P **7 Claims**

1. A continuous process for preparing phenylphosphonous dichloride having negligible amounts of polychlorinated biphenyl which comprises continuously reacting white or yellow phosphorous with phosphorus trichloride and monochlorobenzene at a temperature ranging from about 275° C. to about 400° C., a pressure ranging from about 40 atm to about 80 atm and in the presence of a stoichiometric excess of from at least about 50% of monochlorobenzene.

4,409,153

O-(2-ARYL-3-OXO-1-CYCLOHEXENYL) PHOSPHATES

Leonard E. Hodakowski, St. Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 134,865, Mar. 28, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,419

Int. Cl.³ C07F 9/177; A01N 57/12

U.S. Cl. 260—946 **5 Claims**

1. O-[2-(2'methylphenyl)-5,5-dimethyl-3-oxo-1-cyclohexenyl]-O-ethyl-S-n-propyl thiophosphate.

2. O-[2-(2'-methylphenyl)-5,5-dimethyl-3-oxo-1-cyclohexenyl]-O-ethyl-S-n-butylthiophosphate.

3. O-[2-(2',4'-dimethylphenyl)-5,5-dimethyl-3-oxo-1-cyclohexenyl]-O-ethyl-S-n-propyl thiophosphate.

4. O-[2-(2',4'-dichlorophenyl)-5,5-dimethyl-3-oxo-1-cyclohexenyl]-O-ethyl-S-n-propyl thiophosphate.

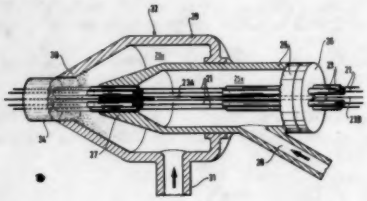
5. O-[2-(2'-methyl-4'-chlorophenyl)-5,5-dimethyl-3-oxo-1-cyclohexenyl]-O-ethyl-S-n-propyl thiophosphate.

4,409,154

METHOD AND APPARATUS FOR MANUFACTURING A WATERTIGHT OPTICAL FIBER CABLE

Bernard Grenat, La Mulatiere, France, assignor to Societe Anonyme dite Compagnie Lyonnaise de Transmissions Optiques, Clichy, France

Filed Feb. 4, 1981, Ser. No. 231,527
Claims priority, application France, Feb. 6, 1980, 80 02563
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—1.5 **4 Claims**



1. A method of manufacturing an optical fiber cable of the type which comprises at least one tubular cylindrical structure of plastic material having a plurality of longitudinal bores housing individual optical fibers and filled with a viscous substance, said method comprising the steps of:

passing the optical fibers through respective tubes which each have a gap of some length;

injecting a viscous substance under pressure into said tubes through said gaps so that said viscous substance fills the tubes around the optical fibers;

causing the optical fibers coated with said viscous substance to protrude beyond the ends of said tubes;

simultaneously extruding a thermoplastic material around the coated optical fibers through an annular orifice and under sufficient pressure to completely cover said optical fibers with their respective coatings of viscous substance;

maintaining the relative pressure of injection of the viscous substance and that of the extrusion of said thermoplastic material to prevent radial expansion of the thermoplastic material when it leaves the annular orifice before it is cooled; and

rapidly cooling the cylindrical structure thus obtained such that the extruded thermoplastic material cools to solidification prior to said viscous substance and constitutes a uniform body occupying the space between the optical fibers and their coatings of viscous substance, and wherein there are no voids within the viscous substance between the thermoplastic material and said optical fibers.

3. Apparatus for manufacturing an optical fiber cable of the type which comprises at least one tubular cylindrical structure of plastic material having a plurality of longitudinal bores housing individual optical fibers and filled with a viscous substance, said apparatus comprising:

an inner cylindrical chamber having an upstream end plate and a conical downstream end which forms a nozzle;

optical fiber guide tubes extending parallel to the axis of the inner cylindrical chamber and passing through said upstream end plate and through said conical downstream end, and wherein the portions of said guide tubes within said inner cylindrical chamber include openings such that they can be filled with a viscous substance under pressure from said inner cylindrical chamber;

a pipe for supplying the viscous substance under pressure to said inner cylindrical chamber, said pipe communicating with said inner cylindrical chamber;

an outer cylindrical chamber surrounding said inner cylindrical chamber and being spaced therefrom for supplying a melted thermoplastic substance under pressure, the downstream end of said outer chamber ending in a conical die surrounding said nozzle of said inner cylindrical chamber; and

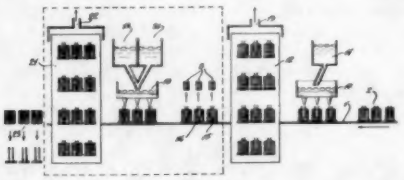
a pipe for supplying a thermoplastic substance under pressure, said pipe communicating with said outer chamber.

4,409,155

EXPLOSIVE BOOSTER MANUFACTURE

Joseph R. Bonnycastle, St. Bruno; Alfred G. Michaud, and Edward K. Rowley, both of Beloeil, all of Canada, assignors to C-I-L Inc., North York, Canada

Filed Dec. 18, 1980, Ser. No. 217,856
Claims priority, application Canada, Feb. 4, 1980, 345004
Int. Cl.³ C06B *21/00*
U.S. Cl. 264—3 R **5 Claims**



1. A semi-automatic, semi-continuous method for manufacturing a cast high explosive booster which comprises the consecutive steps of:

(a) preparing an assembly consisting of a base plate, a tubular shell removably secured to said base plate and one or more operative pins removably secured to said base plate within the confines of said tubular shell;

(b) advancing said assembly to an inspection and indexing station where leakproof mounting of the said tubular shell on the said base plate is provided;

(c) advancing the said assembly to a molten explosives dispensing station;

(d) filling the said tubular shell with molten explosives;

(e) advancing the said assembly and filled tubular shell to a cooling station;

(f) advancing the said cooled tubular shell and assembly to a disassembly station where the said pins and the said base plate are separated from the said filled tubular shell; and

(g) advancing the said filled, cooled shell to a packaging station.

4,409,156

PROCESS FOR PRODUCING MICROCAPSULES

Yoshiyuki Hoshi, and Takayuki Hayashi, both Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1980, Ser. No. 193,059
Claims priority, application Japan, Oct. 2, 1979, 54-126968
Int. Cl.³ B01J *13/02*
U.S. Cl. 264—4.33 **10 Claims**

1. A process for producing microcapsules consisting essentially of the steps of: (a) preparing a solution of melamine and formaldehyde prepolymer, (b) preparing a solution of a styrene-sulfonic acid polymer, (c) dispersing a core material in said styrene-sulfonic acid polymer solution, (d) mixing said melamine-formaldehyde prepolymer solution and said styrene-sulfonic acid polymer solution, (e) heating said solutions to

form microcapsules having melamine-formaldehyde members wherein the ratio of styrene-sulfonic acid polymer to melamine in the capsule production system is about 0.2 to 20.

4,409,157

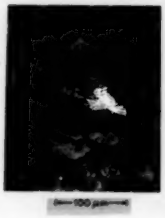
METHOD FOR IMPROVED DECOMPOSITION OF METAL NITRATE SOLUTIONS

Paul A. Haas, and William B. Stines, both of Knoxville, Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 21, 1981, Ser. No. 226,576

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 **2 Claims**



1. A method for co-conversion of an aqueous solution containing heavy metal nitrates, selected from the group consisting of uranium, plutonium, thorium, and their combinations, to produce the corresponding metal oxide in a substantially anhydrous state which is capable of directly producing loadable quality nuclear fuel pellets comprising the step of contacting said solution with ammonium nitrate for sufficient time at a temperature in the range of about 300° to 800° C. and in an amount sufficient to provide a molar ratio of ammonium nitrate to total heavy metal in the solution of about 0.5 to 5.0 for effecting the production of metal oxides having a B.E.T. (N_2 absorption) surface area of 5–15 m^2/g, a predominant (50 to 90%) average particle size of 10 microns or less, and a sinterability to a metal oxide of 91 ±3% of the corresponding theoretical crystal density.

4,409,158

SPRAY DRYING METHOD OF PREPARING HOLLOW FIBERS

Bruce D. Spivak, Norristown, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Division of Ser. No. 227,130, Jan. 22, 1981, Pat. No. 4,361,624. This application Apr. 2, 1982, Ser. No. 365,061

Int. Cl.³ B29C *6/00;*

U.S. Cl. 264—8 **3 Claims**

1. The process for preparing hollow fibers of more than about 100 microns in length by spray drying, comprising the steps of:

a. Preparing an aqueous solution of sodium silicate and a "polysalt," said solution having a viscosity of 300 cp or more;

b. Subjecting said solution to spray or centrifugal force, thereby forming fibers that are at least 5 times longer than their diameter, in a spray dryer.

c. Maintaining the spray dryer at an inlet temperature of 175° to 500° C. and an outlet temperature of 100° to 300° C.; and

d. Recovering the desired product.

4,409,159

MOULDING REINFORCED CONCRETE ARTICLES

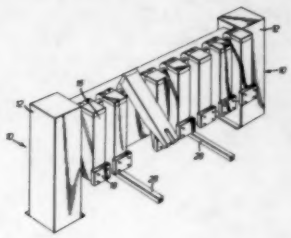
Ian C. N. W. Parkins, Peterborough, England, assignor to Dow Mac Concrete Limited, Stamford, England

Filed Jun. 23, 1981, Ser. No. 276,267

Claims priority, application United Kingdom, Jun. 26, 1980, 8020925

Int. Cl.³ B28B *7/04, 23/06, 7/38*

U.S. Cl. 264—39 **12 Claims**



1. A method of manufacturing pre-stressed reinforced concrete articles comprising the steps of

(a) arranging and tensioning elongate reinforcing members in a casting bed lying between two abutment assemblies each said assembly including clamping means serving to hold the reinforcing members, the clamping means of one said assembly being pivotally displaceable to an inoperative position;

(b) moving a plurality of open-ended moulds through said one abutment assembly in the length direction of the reinforcing members on to the casting bed with the reinforcing members lying within the cross-section of the moulds;

(c) closing off the ends of the moulds;

(d) filling the moulds with concrete and allowing the concrete to cure to a degree sufficient to accommodate the tension in the reinforcing members;

(e) releasing the reinforcing members from the clamping means of both assemblies;

(f) pivotally displacing the clamping means of said one assembly to the inoperative position;

(g) removing the moulds in the length direction of the reinforcing members from the casting bed;

(h) severing the reinforcing members at locations between adjacent end-to-end moulds; and

(i) de-moulding the pre-stressed concrete articles.

3. A method according to claim **1** wherein the moulds are cleaned and greased at a location remote from the casting bed.

4,409,160

METHOD FOR CONTROLLING THE THICKNESS OF A FILM PRODUCT

Nobuhiko Kogo; Yoshimitsu Tsutsui; Koji Kato, and Hisao Kishigami, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 238,358

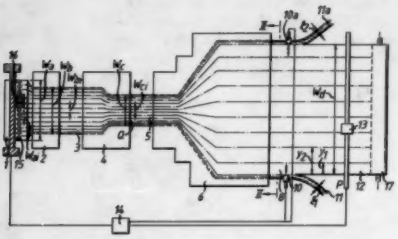
Claims priority, application Japan, Feb. 28, 1980, 55-24457; Feb. 28, 1980, 55-24458; Mar. 21, 1980, 55-34898

Int. Cl.³ G05D *5/03;* B29F *3/00*

U.S. Cl. 264—40.1 **2 Claims**

1. A method for automatically controlling the thickness of extruded biaxially elongated films characterised in that a correlation between positions along the widthwise direction of a film sheet and positions of die manipulation bolts of an extrusion die is obtained, and initially, a profile of the film sheet prior to lateral elongation is converged into a tolerable range; therafter, the thickness of the film sheet after lateral elongation

is measured, and if there are thickness deviations outside the tolerable range, a thickness regulation is effected by transmit-



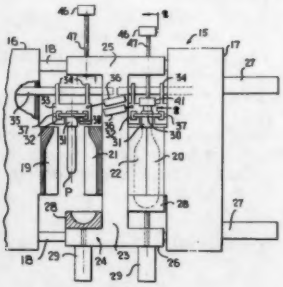
ting a signal corresponding to the thickness deviations to appropriate die manipulation bolts.

4,409,161

BLOW MOLDING METHOD

Ieuan L. Harry; Suppayan M. Krishnakumar, both of Nashua; Walter R. Jolly, Merrimack; Martin H. Beck, Brookline, all of N.H., and John F. E. Pocock, New Isenburg, Fed. Rep. of Germany, assignors to The Continental Group, Inc., Stamford, Conn.

Filed Nov. 13, 1981, Ser. No. 321,152
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—40.1 **10 Claims**



1. A method of blow molding a preform within a split blow mold into a blown article, said method comprising the steps of placing a preform between a pair of open blow mold halves, then introducing a stretch rod into the preform and advancing a blow head to a position adjacent the preform, next initiating closing of the blow mold and advancing the stretch rod to effect axial stretching of the preform and seating the blow head on the preform in sealed relation, thereafter clamping closed the blow mold halves together at a preselected force, and then introducing a high pressure blow medium into the preform and effecting complete blow molding of the preform to the configuration of the blow mold.

4,409,162

PROCESS FOR PRODUCING ACRYLONITRILE SEPARATION MEMBRANES IN FIBROUS FORM

Seiji Takao, Okayama, Japan, assignor to Japan Exlan Company Limited, Japan

Continuation of Ser. No. 22,367, Mar. 20, 1979, abandoned. This application Oct. 7, 1980, Ser. No. 195,058
Claims priority, application Japan, Apr. 3, 1978, 53-39334; Apr. 5, 1978, 53-40582
Int. Cl.³ B29D *27/04*; B01D *31/00*
U.S. Cl. 264—41 **8 Claims**

1. A process for producing acrylonitrilic hollow fiber, which comprises dissolving an acrylonitrile polymer in formamide-containing dimethylformamide to prepare an acrylonitrile polymer solution containing more than 80 wt.% of acrylonitrile units, the molecular weight of said acrylonitrile polymer expressed by [η] as measured in DMF at 30° C., being 0.4–4 and the concentration of said acrylonitrile polymer in said solution being from 10 to 35 wt.% based on the weight of said solution; shaping said polymer solution into a hollow fibrous product while maintaining the temperature of the solution at a temperature above the gellation temperature, determining the gellation temperature by the following procedure: pouring about 150 to 180 g of a sample solution into a beaker which is about 5.5 cm in diameter and about 11 cm in height; dipping said beaker into a temperature-controlled water bath maintained at the same temperature level as the dissolution temperature, then lowering the temperature of the solution at the rate of about 10° C./hour, accompanied by lowering the temperature of the water bath, and at a given point in time during this temperature lowering, placing a glass rod which is 3 mm in outer diameter and 2.5 g in weight, vertically on the surface of the solution while being supported lightly at its upper portion by a ring-shaped holder, then permitting the glass rod to penetrate into the solution under the action of its own weight and sinking, measuring the time elapsed until a sinking depth of 5 cm is attained, and employing the solution temperature at which the time elapsed first exceeds 5 seconds as the gellation temperature of the solution; bringing the surface layer of the hollow fibrous product into contact with an aqueous solution, at a temperature below 10° C., containing more than 30 wt.% of a water-soluble solvent compatible with the mixed solvent, said aqueous solution being referred to as solvent removal treatment medium A, immediately or after bringing it into contact with an inert atmosphere; bringing the core of the hollow fibrous product immediately into contact with an aqueous solution, at a temperature above 10° C., containing less than 30 wt.% of a water-soluble solvent compatible with said mixed solvent or an inert medium, said aqueous solution or said inert medium being referred to as solvent removal treatment medium B, or bringing it into contact with said solution after bringing it into contact with an inert atmosphere, thereby removing the solvent; and then stretching the solidified fiber thus obtained.

4,409,163

METHOD FOR MOLDING A COMPOSITE FOAMED RESIN PULL STRAP

Dick T. Van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

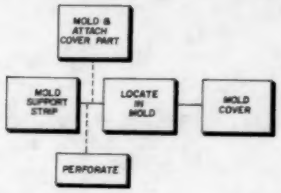
Filed Nov. 28, 1980, Ser. No. 211,431
Int. Cl.³ B29D *27/04*
U.S. Cl. 264—45.5 **10 Claims**

1. A method of molding a pull strap handle having a strong and resilient support element formed as a flat, thin strip with two face sides, a region of said element between the ends of said element being enclosed within a cover formed to provide a firm side on one face side of said element and a soft side on an opposite face side of said element, said molding method comprising:

a. molding said firm side of said cover of a resin material;

b. attaching said firm side of said cover to said one face side of said support element;

c. locating said support element and said attached firm side of said cover in a mold from which the free ends of said support element extend, said mold having a cavity arranged adjacent said opposite face side of said element; and



d. forming said soft side of said cover of a self-skinning foamed resin material molded to the shape of said cavity and bonded to said support element and said firm side of said cover.

4,409,164

PROCESS OF MAKING PRODUCTS CONSISTING OF FOAMED AND/OR CROSS-LINKED SYNTHETIC POLYMERS

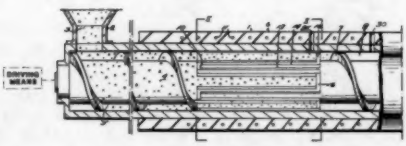
Albert J. H. Brasz, Born, Netherlands, and Hermanus A. Wallink, Selfkant, Fed. Rep. of Germany, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Mar. 25, 1981, Ser. No. 247,546

Claims priority, application Netherlands, Mar. 25, 1980, 8001732

Int. Cl.³ B29D *27/00*; B29F *3/02*

U.S. Cl. 264—50 **12 Claims**



1. In processes for the formation by extrusion of synthetic polymer products containing foaming and/or cross-linking agents using an extrusion machine equipped with screw means for effecting at least partial distribution of the foaming and/or cross-linking agents in the polymer composition during the extrusion process, the improvement consisting essentially in enhancing the rate of production of said foamable or cross-linkable products at a given extrusion exit temperature by providing and utilizing a modified screw means in the melting zone of the extrusion machine said modified screw means having a melting torpedo device incorporated therein, and extruding the said polymer composition at an extrusion rate higher than the maximum rate at which useful products can otherwise be obtained under otherwise equal conditions as regards the use of extrusion machines equipped with unmodified screw means, polymer material, foaming and/or cross-linking agents, and the exit temperatures employed.

6. Process according to claim 1, wherein in a direct foaming process a physically active foaming agent is used.

4,409,165

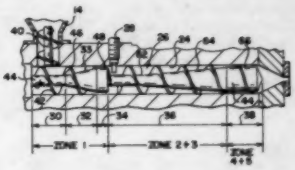
METHOD AND APPARATUS FOR EXTRUDING A CELLULAR PRODUCT

Hueng T. Kim, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 18, 1981, Ser. No. 274,921

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—53 **10 Claims**



1. A method for extruding a cellular polymeric resin comprising the steps of charging a particulate polymeric resin into an extruder having disposed therein an elongated screw, conveying said particulate resin through the extruder, densifying said particulate resin in a compaction section, forming a continually moving barrier in the form of a cylindrical plug of a uniform thickness of said densified resin that is substantially impervious to a blowing agent at a location downstream of the compaction section, injecting a blowing agent downstream of the barrier into said solid particulate resin, mixing said solid particulate resin and said blowing agent, melting said mixture of said resin and said blowing agent, and extruding said molten mixture into a zone of lower pressure whereupon the blowing agent expands within said molten resin to form a cellular product.

4,409,166

METHOD OF PRODUCING FIREPROOF BRICKS

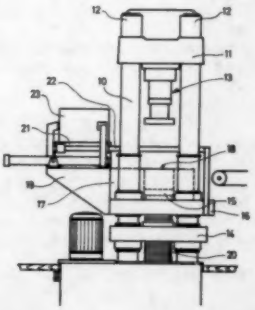
Willy Vogt, Zurich, Switzerland, assignor to Bucher-Guyer AG, Zurich, Switzerland

Filed Apr. 2, 1981, Ser. No. 250,233

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3014068

Int. Cl.³ B28B *1/08*; B29C *11/00*

U.S. Cl. 264—72 **5 Claims**



1. In a method for the manufacture of bricks with the aid of a mold, normally open on top, ceramic material introducible into said mold, and a piston disposed above said mold, movable with respect to said mold, and forming a cover surface of said mold when entering the top of the mold,

the steps comprising:

exerting a quasi-static pressure by said piston on said ceramic material, and

applying a very rapidly increasing impact pressure on said

ceramic material, said impact pressure being superimposed upon said piston.

4,409,167

PROCESS FOR EXTRUDING A MODIFIED HIGH MOLECULAR WEIGHT POLY(ETHYLENE TEREPHTHALATE) RESIN

Robert J. Kolouch, Vienna, W. Va., and Rudolph H. Michel, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 224,673, Jan. 13, 1981, abandoned. This application Dec. 21, 1981, Ser. No. 332,768

Int. Cl.³ B29B *1/10*

U.S. Cl. 264—102 **13 Claims**

1. A process for extruding a bubble-free article from a polymeric composition selected from the class consisting of:

(a) poly(ethylene terephthalate) resin;

(b) a uniform blend of poly(ethylene terephthalate) resin with a compatible polymer, the amount of the compatible polymer being at most about 10 weight percent of the blend; and

(c) a uniform blend of a poly(ethylene terephthalate) resin with an incompatible polymer and a compatibilizing agent, the total amount of the incompatible polymer and compatibilizing agent being at most about 20 weight percent of the blend;

said process comprising:

(1) premixing an organic diisocyanate with said polymeric composition or individual components of said composition, in any order, the amount of said diisocyanate being sufficient to increase the melt viscosity of said polymeric composition to the desired level without causing excessive crosslinking;

(2) introducing the premix of step (1) into the feed section of a twin-screw extruder having a cold feed section, a hot plastication zone, a kneading zone maintained at an average temperature of about 280° to 320° C., a venting zone maintained at an average temperature of about 280° to 320° C. and at a pressure of less than about 1.33 kPa, a metering zone maintained at an average temperature of about 260° to 280° C., and an extrusion due maintained at an average temperature of about 255° to 265° C., all the temperatures being wall temperatures; and

(3) operating the extruder at about 30–120 rpm and at a pressure of about 350 kPa or less to recover the extruded article from the die.

4,409,168

METHOD OF FORMING COMPONENTS FOR A HIGH-TEMPERATURE SECONDARY ELECTROCHEMICAL CELL

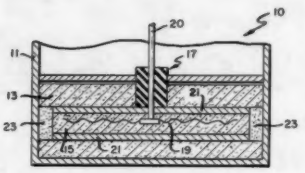
Franklin C. Mrazek, Hickory Hills, and James E. Battles, Oak Forest, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 22, 1981, Ser. No. 266,251

Int. Cl.³ H01M *2/16*

U.S. Cl. 264—104 **15 Claims**

1. A method of forming a component for a high-temperature secondary electrochemical cell, said component being one of the group of secondary electrochemical cell components selected from a positive electrode, a negative electrode, and an electrically insulative porous separator, wherein said positive electrode including as positive electrode-active material, a sulfide selected from the group consisting of lithium sulfides, iron sulfides, nickel sulfides, copper sulfides and cobalt sulfides, said negative electrode including as negative electrode-active material, an alloy of aluminum and said electrically insulating porous separator being between said electrodes, the improvement comprising forming a slurry of solid particles dispersed in a molten electrolyte including alkali metal salt at a temperature above its melting point, said solid particles being selected from the group consisting of said positive-electrode-active material, said negative-electrode-active material and



electrically insulating ceramics which are substantially insoluble in said electrolyte and sulfide compatable, casting said slurry into a form having the shape of one of said secondary electrochemical cell components and smoothing the exposed surface of the slurry, cooling said cast slurry to form a solid, and removing said secondary electrochemical cell component.

4,409,169

METHOD FOR MANUFACTURING DISK-SHAPED INFORMATION CARRIERS

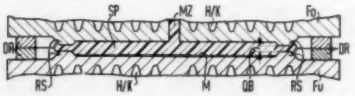
Dieter Bartholdsten, Hanover; Hermann Koop, Ronnenberg; Erhard Schrode, Lehrte, and Adelbert Zielasek, Burgwedel, all of Fed. Rep. of Germany, assignors to Polygram GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,618

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028947

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **12 Claims**



1. In a method for manufacturing disk-shaped information carriers with a high storage density which can be optically read out, of the type manufactured out of transparent synthetics employing a molding press equipped with at least one pressing matrix, the press havng a compression form comprised of separable mold halves which can be moved towards one another and both of which have means for heating and cooling during the pressing cycle, wherein the improvement comprises: said mold halves each being provided with an annular ridge, the ridges lying opposite one another so as to form a squeezing gap when the mold is closed and serving as an outer boundary for the hollow space of the mold at which material can flow through the gap;

preheating the transparent synthetic material to a temperature significantly greater than the initial pressing temperature of the compression form;

injecting an excess of the preheated material than is required for the finished product into the compression form via a central aperture in one of the mold halves so as to form a lump of material;

pressing the lump of material by closing the compression form to obtain a squeezing gap width with a magnitude equal to several tenths of the thickness of the finished storage disk, said squeezing gap maintaining a pressure in the pressed material while permitting excess material to

squeeze therethrough, said pressing step being initiated prior to the termination of the injecting step;

cooling the compression form, said cooling step being initiated prior to the termination of the pressing step; and

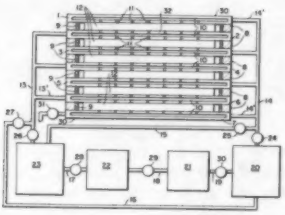
the pressing and cooling steps chronologically proceeding in an internal sequence which approximates an exponential function so that along with the use of the squeezing gap condensation bubbles and double diffraction effects due to frictional and shearing forces are substantially avoided.

4,409,170

PRODUCTION OF COMPOSITE PRODUCTS BY CONSOLIDATION USING PRESSURE AND CONVECTION HEATING

John Stofko, St. Charles, Ill., assignor to John Jansky, France

Filed Dec. 31, 1981, Ser. No. 336,481
Int. Cl.³ D04H *1/16*
U.S. Cl. 264—113 **18 Claims**



1. In a method of forming a product of low to medium density by consolidation of fibrous, particulate or laminar materials in the presence of a bonding agent, under heat and pressure, the improvement wherein

said materials are pressed in a closed, sealed press and heated substantially entirely by the direct passage thereinto of a fluid heat carrier at superatmospheric pressure and having a temperature sufficient to plasticize said materials and to heat the bonding agent to a temperature at which consolidation of said materials occurs, said heating being carried out for a time sufficient to effect complete consolidation of said materials, said heat carrier being distributed uniformly to said materials through one side thereof or through opposite sides, and (1) passed out therefrom also along one or opposite sides, or (2) said fluid heat carrier being left within said materials for a time sufficient to permit it to expand therein to atmospheric pressure.

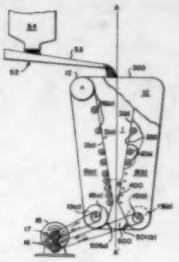
4,409,171

METHOD OF DENSIFYING POWDERS

Gonzalo S. Leon; John E. Fraize, both of Sudbury, Mass., and Richard C. Fortier, University City, Mo., assignors to Cabot Corporation, Boston, Mass.

Division of Ser. No. 211,379, Nov. 28, 1980, Pat. No. 4,325,686. This application Apr. 19, 1982, Ser. No. 369,941
Int. Cl.³ B29J *5/00*
U.S. Cl. 264—120 **9 Claims**

1. A method for densifying powder materials which comprises: providing an enclosed convergent densifying zone having a divergent feed end, a convergent discharge end and an angle of convergency, θ, said zone being defined by a pair of opposed gas-permeable belts supported spanwise by a plurality of spaced apart support rolls arranged in opposed parallel pairs, each said pair of rolls having a gap therebetween defining a distinct densifying station; driving said belts toward the convergent discharge end of said zone at essentially equal speeds; feeding powder material to be densified into the divergent feed end of said zone at a rate sufficient to provide and maintain an essentially complete fill thereof and recovering



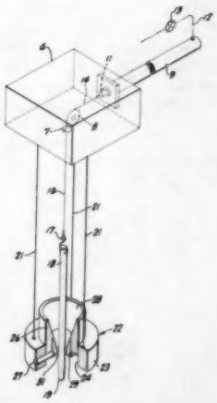
densified powder material product discharged from the convergent discharge end of said zone.

4,409,172

DEVICE AND METHOD FOR FABRICATING MULTI-LAYER TUBING USING A FREELY SUSPENDED MANDREL

Robert S. Ward, Jr., Lafayette, and Donald R. Beckham, Livermore, both of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Feb. 13, 1981, Ser. No. 234,120
Int. Cl.³ B29F *3/00*; B29C *1/00*
U.S. Cl. 264—209.2 **18 Claims**



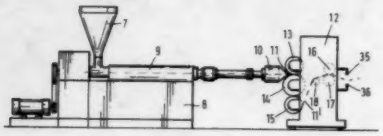
4. A method for fabricating tubing comprising positioning an elongated mandrel vertically within and through a reservoir having an opening in the bottom thereof and forming an annular opening therebetween, maintaining said mandrel and reservoir free for lateral movement relative to each other in all directions, placing a tubing material in said reservoir and permitting said tubing material to pass through said annular opening to form said tubing.

4,409,173

PROCESS AND APPARATUS FOR THE MANUFACTURE OF OBJECTS OF CRYSTALLINE POLYSTYRENE

Pietro Padovani, Verona, Italy, assignor to O.M.V. SpA, Italy

Filed Nov. 9, 1981, Ser. No. 319,242
Claims priority, application Italy, Nov. 17, 1980, 84970 A/80
Int. Cl.³ D01D 5/12
U.S. Cl. 264—210.2 11 Claims



1. A process for the manufacture of objects, such as cups, containers or other packaging, of crystalline polystyrene comprising the steps of:

heating particulate crystalline polystyrene to form molten material,

continuously extruding said molten crystalline polystyrene through a die having an outlet with an adjustable profile to form a sheet,

rolling and stabilizing said sheet,

heating both edges of the sheet,

drawing the sheet by applying lateral guides to the heated edges,

passing the drawn sheet through a heating device to heat both surfaces and through a subsequent forming device to form said objects,

removing the objects so obtained from the press component of the forming device and

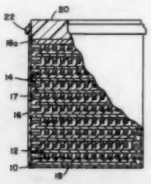
grinding up the waste.

4,409,174

METHOD FOR BATCH PRODUCTION OF ISOSTATICALLY PRESSED CALCIUM POWDER DISCS

Albert Toy, Gardena; Louis L. Constantino, Placentia, and Donald B. Evans, Redondo Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1981, Ser. No. 334,099
Int. Cl.³ B28B 3/00
U.S. Cl. 264—313 5 Claims



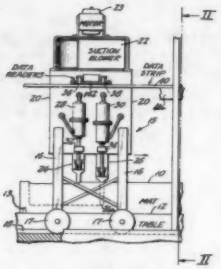
1. A method for batch production of low cost isostatically pressed powder calcium discs comprising placing one at a time a multiplicity of molds with calcium powder thereon in a bag of flexible material until said bag is filled with a stack of said molds one on top of the other and contiguous, sealing said bag with a top cap, isostatically pressing said bag with said molds contained therein to isostatically press the powder calcium on said molds, removing said molds with the isostatically pressed calcium disc thereon from said bag and subsequently removing the formed discs from said molds.

4,409,175

METHOD OF PRESHAPING A PREFORMED LIGNOCELLULOSIC MAT FOR MOLDING INTO A STRUCTURAL MEMBER

Georg Bjorhaag, Amal, Sweden, assignor to Byggnads AB Hammaren, Bromma, Sweden

Filed Sep. 16, 1980, Ser. No. 187,765
Int. Cl.³ B29J 5/00
U.S. Cl. 264—517 12 Claims



1. A method of preshaping a preformed lignocellulosic mat and then pressure-molding the same in a mold to produce a structural member, comprising the steps of:

making a mat of a mixture of lignocellulosic particles and a hardenable binder, in which mixture said particles are coated with said binder, by compacting a layer of said mixture on a flat bed to an extent barely sufficient to provide enough coherence for transfer thereof to a component of said mold without substantial risk of disintegration of the mat;

trimming the mat in its thickness by insertion, into one surface thereof, of a movable tubular extremity of at least one suction device to pull particles by suction into said at least one suction device in order to reduce the thickness of the mat at predetermined locations to a predetermined extent;

placing the trimmed mat in a component of said mold in a molding press in a predetermined position of said mat relative to said mold; and

then pressure molding a structural component from the trimmed mat in said molding press and curing the same by hardening said binder and thereby firmly bonding said particles.

4,409,176

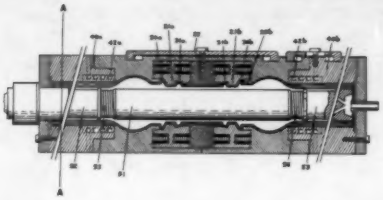
METHOD FOR MOULDING AN ARTICLE FROM PLASTIC MATERIAL

Kjell M. Jakobsen, Skanör; Claes T. Nilsson, Löddeköpinge, and Lars G. Larsson, Höör, all of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Filed Oct. 14, 1980, Ser. No. 196,374
Claims priority, application Sweden, Jan. 30, 1980, 80007222
Int. Cl.³ B29C 17/07
U.S. Cl. 264—527 14 Claims

1. A method of molding an article from a tube-shaped parison comprising introducing a parison of thermoplastic material having an oriented portion which is of relatively high strength and resistant to stretching into a mold having a wall with a cylindrical mold surface provided with a plurality of axially spaced recesses therein, applying internal pressure to the parison to bring a plurality of regions of the oriented portion of the parison into contact with the cylindrical mold surface in axially spaced regions of the mold adjoining said recesses such that the parison extends across the recesses without entering into contact with the mold wall at said recesses, and relatively displacing said axially spaced regions of said mold in axial direction to axially shift the plurality of axially spaced regions

of the parison while concurrently applying the internal pressure to said parison and reducing the axial extent of said recesses to a final position in which said recesses are of ring-shape with a defined cross-sectional profile, the relative axial displacement of said regions of the mold in combination with the reduction of the axial extent of the recesses and the internal pressure applied to the parison causing said regions of the



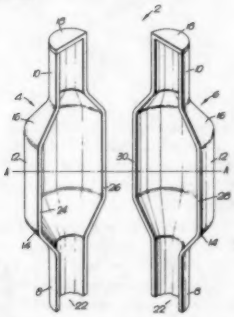
parison in contact with the mold under the application of internal pressure to be correspondingly relatively axially displaced with said regions of the mold while the regions of the oriented portion of the parison extending across said recesses are deformed into said recesses under said internal pressure without substantial stretching and reduction in wall thickness to assume the shape of said recesses in said final position and form a ring-shaped profile on said article.

4,409,177

METHOD OF FORMING A WRAPAROUND CLOSURE ARTICLE

Jorgen Berth; Erling Hansen, both of Los Altos; Malcolm D. Heaven, Cupertino, all of Calif., and Tommy Petersen, Ishoej, Denmark, assignors to Raychem A/S, Glostrup, Denmark

Filed Oct. 1, 1981, Ser. No. 307,451
Int. Cl.³ B23B *1/00*
U.S. Cl. 264—531 **12 Claims**



1. A method of forming a wraparound closure article comprising a longitudinally-slit, generally tubular body potion having upstanding closure means adjacent the longitudinal slit, which method comprises:

(a) positioning a hollow elongate parison of polymeric material within an open split-mould such that on closing the mould at least one longitudinal edge portion of the parison is held between two parts of the mould to form the upstanding closure means;

(b) closing the mould;

(c) expanding the hollow parison into contact with the mould by differential pressure to form the body portion; and

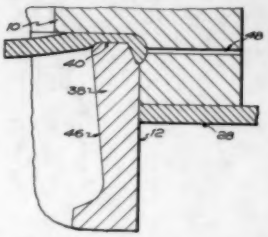
(d) slitting the article along the or each longitudinal edge portion.

4,409,178

FORMATION OF BEADED EDGES ON PLASTICS MATERIALS ARTICLES

Peter Ward, Leeds, England, assignor to Plastona (John Waddington) Ltd, England

Continuation of Ser. No. 41,198, May 21, 1979, abandoned. This application Nov. 7, 1980, Ser. No. 204,814
Claims priority, application United Kingdom, May 31, 1978, 24809/78
Int. Cl.³ B29C *17/04, 17/10*
U.S. Cl. 264—544 **9 Claims**



1. A method of producing an article with a beaded edge from a heated plastics sheet material wherein the article is formed in a mold, the method including the steps of:

(a) locating the heated plastics sheet material between spaced complimentary male and female mold parts of the mold in which the article is formed;

(b) bringing the mold parts together and severing from the sheet by such action a flat blank of the plastics sheet material from which the whole article is produced;

(c) continuing the movement together of the mold parts after said severing with the blank still in flat form until the blank engages the base of the female mould part when the female and male mould parts squeeze the blank on opposite sides in a continuous annular edge region of said severed portion adjacent the line along which the said blank was severed from the remainder by means of faces of the mold parts which are directly opposite in the direction of movement together of the mold parts so that the plastics material where squeezed is reduced in thickness and the displaced material is displaced outwardly into a bead cavity defined by the mold and located outwardly of the said edge region;

(d) continuing to squeeze the sheet material until the bead cavity is completely filled with displaced plastics material so that the said bead will have a pre-determined cross-sectional shape; and

(e) forming the article in the mold.

4,409,179

PRESSURIZED CORE SHROUD FOR ALIGNING A NUCLEAR REACTOR CORE

Joseph M. Burger, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 8, 1980, Ser. No. 214,162
Int. Cl.³ G21C *5/08*
U.S. Cl. 376—302 **12 Claims**

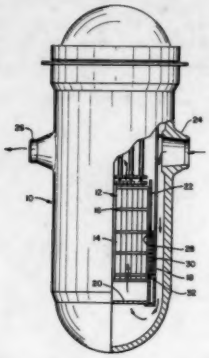
1. A core alignment shroud for insertion in a nuclear reactor vessel, the reactor vessel having means for introducing a flow of coolant through the reactor core, comprising:

an elongated, hollow frame for mounting in the vessel, the frame having an inner surface closely conforming in shape to the lateral perimeter of the core;

a flexible panel sealingly attached along its edges to the inner surface of the frame to form a chamber therebetween;

conduit means having a first end opening into the chamber and a second end adapted for fluid communication with the reactor coolant at a location upstream of the core,

such that when the shroud is in the vessel and reactor coolant is flowing, the pressure of the fluid upstream of the core is higher than the pressure acting on the outer



surface of the panel creating a pressure differential across the panel which deflects the panel inwardly against the core.

4,409,180

PROCESS FOR MANUFACTURING RARE EARTH INTERMETALLIC HYDRIDABLE COMPOUNDS

Gary D. Sandrock, Ringwood, N.J.; Ernest L. Huston, Tuxedo Park, N.Y., and James Liu, Ramsey, N.J., assignors to MPD Technology Corporation, Wyckoff, N.J.

Filed May 26, 1982, Ser. No. 382,171
Int. Cl.³ C22C *19/03*
U.S. Cl. 420—455 **2 Claims**

1. In the manufacture of intermetallic hydridable compounds of the RB_x type having a predictable plateau pressure where R is at least 2 members of the group of rare earth metals consisting of cerium, neodynmium, praseodymium and lanthanum and no single element of said group comprises greater than 0.95R, where B is nickel and where x is a number from 4.5 to 5.5, the improvement comprising formulating and alloying along with a stoichiometric quantity of nickel, rare earth elements together in weight fractions in accordance with the following equation

$$P_{25}=\exp(10.60-5.70X_{Ce}-10.03X_{La}-8.46X_{Pr}-7.40X_{Nd})$$

X being the weight fraction of a given element and

$$X_{Ce}+X_{La}+X_{Pr}+X_{Nd}=1$$

to provide an intermetallic compound having a desorption plateau pressure in atmospheres at 25° C. aproximately as given by the equation.

4,409,181

BRAZING COMPOSITIONS

Brian C. Coad, San Francisco, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 24, 1981, Ser. No. 295,926
Int. Cl.³ C22C *5/08, 28/00, 30/02*
U.S. Cl. 420—502 **4 Claims**

1. A brazing material consisting essentially of a foil having a composition consisting essentially of

(a) from about 50% to about 99% by weight of a brazing alloy consisting essentially of from about 25% to about 40% by weight of copper, from 0 to about 25% by weight of a metal selected from the group consisting of Zn, In, Cd, Sn and mixtures thereof, balance silver

(b) from about 1% to about 50% by weight of an additive that is insoluble in said brazing alloy selected from the group consisting of

(1) molybdenum

(2) mixtures of molybdenum and a metal selected from Fe, Co, W and mixtures thereof,

(3) mixtures of tungsten and a metal selected from Fe, Co and mixtures thereof,

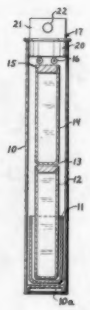
wherein said additive has a density of from about 95% to about 105% of the density of said brazing alloy.

4,409,182

COLORIMETER TEST KIT APPARATUS

F. Sutherland Macklem, 468 Main St., New Canaan, Conn. 06840

Filed Jun. 23, 1980, Ser. No. 162,044
Int. Cl.³ G01N *21/78, 21/80*
U.S. Cl. 422—61 **8 Claims**



1. A colorimetric test kit apparatus comprising a color tube which includes a transparent plastic tubular container having one end closed and leak proof, said tube being provided with an array of non-opaque color windows on its surface, the color of the color windows being selected to at least approximately match the colorimetric response of a measured sample of fluid under test, which color tube can be filled with the fluid under test so as to correct the color of the color windows for any initial coloration of the fluid under test; at least one transparent plastic tubular sample container marked with a sample level line to be used as a sampler vial to provide an accurately measured sample of the fluid under test; at least one hermetically sealed tubular reagent vial containing a chemical reagent; puncturing means for opening said vial to provide a hole of predetermined size to convert it to a dropper to dispense said chemical reagent drop by drop into the measured sample in the sampler vial to develop a colored sample which can be held adjacent to one color window at a time to find the best color match; said tubular reagent vial being disposed in said sampler vial and said sampler vial being disposed in said color tube in a nesting arrangement so that said color tube becomes a holder for the complete test kit when not in use; and removable cap or plug means for closing said color tube, said cap or plug being of a form and size such that the complete test kit can be positioned by hanging closely alongside similar kits to present a conveniently accessible array of colorimetric test kits such as may be required in analyzing a given fluid.

4,409,183
APPARATUS FOR ASCERTAINING THE QUANTITY OF OZONE IN WATER

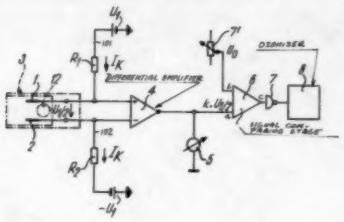
Bertram Fischer, Wolfmadenstrasse 67, D-7000 Stuttgart 80, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 168,403

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928324

Int. Cl.³ G01N *27/26, 27/30*

U.S. Cl. 422—68 **12 Claims**



1. Apparatus for use in ascertaining the quantity of ozone in water, comprising spaced-apart water-immersible first and second electrodes each of which consists of an alloy the predominant metal of which is gold; means for establishing through each of said electrodes a constant flow of electric current in the range of 0.1 to 1 microampere, including means for applying to said electrodes voltages of identical absolute value but opposite polarity; means for measuring the potential difference between said electrodes, including a differential amplifier having output means for the transmission of first signals denoting the measured potential difference; means connecting said measuring means with said electrodes; a source of reference signals denoting a voltage which is indicative of an acceptable quantity of ozone in the water; means for comparing the signals from said amplifier and said source, said comparing means having first and second inputs, and an output arranged to transmit signals denoting the difference between the characteristics of signals received at said first and second inputs; ozonizer means arranged to supply ozone to the water at a rate which is a function of the characteristics of signals at said output of said comparing means; means connecting said output means of said amplifier with said first input; means connecting said source with said second input; and means connecting said output of said comparing means with said ozonizer means.

4,409,184
PARAFFIN WRINKLE AND BUBBLE REMOVER APPARATUS

William Giroir, 3001 B Independence St., Metairie, La. 70002

Division of Ser. No. 181,967, Aug. 28, 1980, Pat. No. 4,357,302. This application Feb. 16, 1982, Ser. No. 348,746

Int. Cl.³ B01L *9/00*

U.S. Cl. 422—99 **3 Claims**

1. A hand held apparatus for removing wrinkles and bubbles in a thin paraffin ribbon, said hand held apparatus having a substantially J-shape and comprising:

a. a pair of normally flexible handles integrally connected together at one end portion of the hand held apparatus and each of said handles integrally connected to an arcuate portion, the arcuate portions providing support to spreader pad portions movable with respect to one another responsive to a flexing of said handles, with said arcuate portions extending downwardly from said handles and then arcing upwardly to support said spreader pad portions;

b. each spreader pad portion being connected to and disposed at the end of each of the arcuate support portions which is not connected to the handles, in such a manner that its top surface is perpendicular to the longitudinal axis of said handle and substantially spaced apart from said handle, wherein each spreader pad portion has a top surface capable of frictionally engaging and supporting, for

spreading, a portion of said paraffin ribbon, and where the top surfaces of the spreader pad portions are alligned such that they can spread said ribbon upon flexing of said handles.

4,409,185
SAFETY DEVICE FOR PACKAGINGS WHICH CONTAIN HYDROGEN EMITTING PYROPHORIC METALLIC CATALYSTS

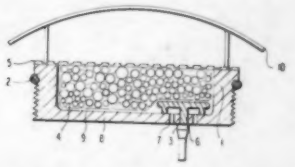
Helmfried Krause, Rodenbach; Hubertus Wobbermin, Frankfurt, both of Fed. Rep. of Germany, and Edgar Geigle, deceased, late of Alzenau, Fed. Rep. of Germany by Brigitte Geigle, legal representative, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,140

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1980, 3039528

Int. Cl.³ G05B *9/00*

U.S. Cl. 422—113 **11 Claims**



1. A safety device for packagings which contain hydrogen emitting pyrophoric metallic catalysts, comprising a hollow, upwardly open stopper (1) containing a cavity provided with sealing means (2) in the bottom (8) of which is arranged valve means (3) for pressure relief, comprising

a mushroom-shaped valve insert of elastic material (6), having a stem and a cap, the stem of which is passed through a bore opening in the stopper bottom (8) and has, beneath the stopper bottom, a thickening constructed as a stop which builds up stress, and the cap of which covers at least one gas throughflow opening (7) at the upper side of the stopper bottom, the distance between the thickening and the cap shoulder being somewhat smaller than the thickness of the stopper bottom,

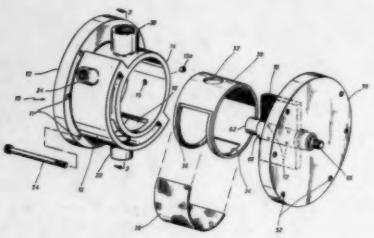
wherein said cavity of the stopper is filled with a catalyst (4) for recombination of hydrogen and oxygen from the air and is closed by a gas-permeable cover (5) connected to the upper edge of the stopper.

4,409,186

CATALYST PARTICLE SIZING APPARATUS

William A. Gibson, and Ting C. Ho, both of Orange, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1982, Ser. No. 347,838
Int. Cl.³ C08F 4/00
U.S. Cl. 422—131 2 Claims



1. A particle sizing apparatus including in combination:
(a) a cylindrical housing whose faces lie in the plane of gravity,
(b) an arcuate opening cut into the lower surface of the cylindrical housing,
(c) a fine mesh screen which overlaps the arcuate opening,
(d) a hemicylindrical housing whose faces lie in the plane of gravity attached to the lower section of the cylindrical housing, and defining a cavity in communication therewith, the depth of the hemicylindrical housing being equal to the depth of the cylindrical housing,
(e) an inlet in the top center surface of the cylindrical housing,
(f) an outlet port in the bottom surface of the hemicylindrical housing,
(g) a first face plate which overlaps and seals one face of each of the cylindrical housing and the hemicylindrical housing,
(h) a second face plate which overlaps and seals the second face of each of the cylindrical housing and the hemicylindrical housing,
(i) a shaft mounted axially within the cylindrical housing and rotatable therein,
(j) brushes mounted on the shaft and extending to contact the entire inner surface of the cylindrical housing and the fine mesh screen fitted therein, and
(k) means for rotating the shaft of.

4,409,187

SEALING AGENT AND LUBRICANT FOR MEDIUM-PRESSURE AND HIGH-PRESSURE AUTOCLAVES

Armin Köhler, Dormagen; Herbert Schuster, Cologne, and Rudi Renner, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,148
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011083
Int. Cl.³ B01J 3/00; C10M 3/16
U.S. Cl. 422—135 6 Claims

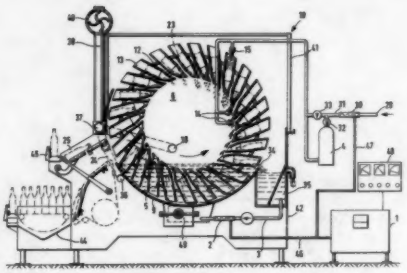
1. In an autoclave containing a stuffing box, which stuffing box contains a sealing agent and/or lubricant the improvement wherein said sealing agent or lubricant is a polyether-polyol which has an average OH-functionality of 5.0 to 7.0 and an average OH number of 250 to 500 and a molecular weight of 600 to 12,000 and a viscosity of 3 to 22 Pas at 25° C. prepared by reacting a mixture of sucrose and at least one other starting molecule chosen from the group comprising:
(a) polyhydric alcohols with an OH-functionality of less than 8,
(b) monoamines or polyamines which contain at least 2 hydrogen atoms bonded to the amino nitrogen and
(c) water, with ethylene oxide and/or propylene oxide.

4,409,188

CONTAINER STERILIZATION

Helmut Silberzahn, Hauptstrasse 72, Mosbach, Baden, Fed. Rep. of Germany D-6950

Filed Sep. 2, 1981, Ser. No. 298,625
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033043
Int. Cl.³ A61L 2/00
U.S. Cl. 422—303 7 Claims



1. An apparatus for sterilizing containers comprising:
a fluid-tight housing having a container inlet and a container outlet;
a plurality of container immersion cells axially mounted for rotation within said housing and at an oblique angle;
an immersion bath within said housing containing a fluid sterilizing agent comprising ozone and water;
a collector adjoining said bath within said housing for receiving excess fluid from said immersion bath, and
means for variable enrichment of the gaseous ozone in said immersion bath, said means comprising at least one spray nozzle for spraying a mixture of ozone and fresh water into the area of said container immersion cells and at least one inlet to said immersion bath for supplying a mixture of ozone and said fluid from said collector.

4,409,189

RECOVERY OF TUNGSTEN FROM BRINES

S. Ralph Borrowman, Bountiful; Paulette B. Altringer, Summit Park, and Parkman T. Brooks, Salt Lake City, all of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

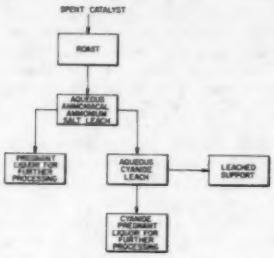
Filed Jul. 13, 1982, Ser. No. 397,735
Int. Cl.³ C01G 41/00
U.S. Cl. 423—54 6 Claims

1. A process for recovery of tungsten from alkaline brines containing boron, arsenic and sulfur impurities comprising:
(a) contacting the brine with a resin consisting essentially of a copolymer of 8-hydroxyquinoline, resorcinol and formaldehyde to load the resin with tungsten and a portion of said impurities;
(b) contacting the loaded resin with an aqueous solution of ammonium chloride, in a concentration of about 0.1 to 2 normal, and ammonium hydroxide in an amount sufficient to provide a pH of about 7.5 to 9.5 to selectively remove boron, arsenic and sulfur values, and thereafter
(c) contacting the loaded resin with water or an alkaline aqueous solution to remove tungsten.

4,409,190
EXTRACTING COBALT FROM SPENT HYDROPROCESSING CATALYSTS WITH CYANIDE

Dean A. Van Leirsburg, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,815
Int. Cl.³ C22B 3/00; C01G 51/00
U.S. Cl. 423—150 3 Claims

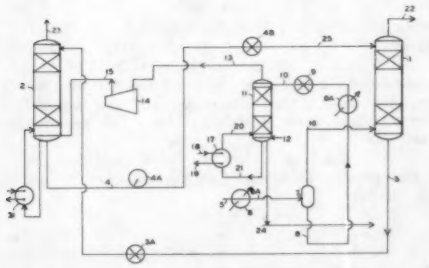


1. A process to leach cobalt from spent catalysts, comprising:
(a) roasting said spent catalysts at between 400° C. and 600° C.;
(b) contacting said roasted catalysts with an aqueous ammonia and ammonium salt leach solution forming pregnant liquor and residual catalyst; and
(c) contacting said residual catalyst with a cyanide ion containing second leach solution forming a second pregnant liquor.

4,409,191
INTEGRATED CYCLIC SCRUBBING AND CONDENSATE STRIPPING PROCESS FOR THE REMOVAL OF GASEOUS IMPURITIES FROM GASEOUS MIXTURES

Robert M. Osman, Parsippany, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 4, 1982, Ser. No. 336,638
Int. Cl.³ B01D 53/34
U.S. Cl. 423—220 7 Claims



1. In a cyclic process for the removal of acid gases from a feed gas stream comprising a hot, steam-containing gas mixture by means of an aqueous alkaline scrubbing solution which is continuously recycled between an absorber in which said acid gases are absorbed by said scrubbing solution and a regenerator in which said acid gases are desorbed by steam-stripping, said hot steam containing gas mixture having at least a portion of the steam content therein condensed and separated from the gas mixture, prior to said gas mixture entering the absorber to form a process condensate having gaseous impurities dissolved therein, the improvement comprising:
(a) subjecting said process condensate to a pressure lower than the pressure at which scrubbing solution regeneration takes place;
(b) subsequently heating the process condensate resulting from, and at the pressure of, step (a) with at least one fluid having a temperature sufficient to boil said process condensate to strip said process condensate of at least a portion of the gaseous impurities dissolved therein and to yield a vaporous mixture comprising steam and said stripped gaseous impurities;
(c) separating said vaporous mixture of step (b) from the stripped process condensate and compressing the vaporous mixture to a pressure at least equal to the pressure at which scrubbing solution regeneration takes place;
(d) introducing said compressed vaporous mixture into the regenerator to assist in said steam stripping.

4,409,192
GAS SCRUBBING METHODS

Frederick W. Lichtner, Richboro, and Jean T. Rose, Fairless Hills, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 26, 1982, Ser. No. 371,403
Int. Cl.³ C01B 17/00
U.S. Cl. 423—242 11 Claims

1. In a process for scrubbing flue gases containing sulfur dioxide for the removal thereof which comprises (1) contacting the flue gases with an aqueous medium containing a material which will react with the sulfur dioxide to form either calcium sulfate or calcium sulfite or both; and (2) separating the insoluble either calcium sulfate or calcium sulfite or both from the aqueous medium, the improvement being adding to said aqueous medium prior to contact with the gas from about 0.5 to 300 parts per million of a combination of
i. a water soluble sulfonated polystyrene, and
ii. a compound having the formula: $(X)_2N—R—N(X)_2$, wherein R is a lower alkylene of from 1 to 7 carbon atoms, X is hydrogen or the group $—CH_2PO_3M_2$, where M is a water-soluble cation, the compound further characterized in that at least one and preferably all X's are $—CH_2PO_3M_2$.

4,409,193
PROCESS FOR PREPARING CUBIC BORON NITRIDE

Tadao Sato; Tadashi Endo; Osamu Fukunaga, all of Sakura, and Minoru Iwata, Matsudo, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Mar. 3, 1982, Ser. No. 354,354
Claims priority, application Japan, Mar. 6, 1981, 56-32139; Mar. 20, 1981, 56-40563
Int. Cl.³ C01B 21/06
U.S. Cl. 423—290 10 Claims

1. A process for preparing cubic boron nitride which comprises heating hexagonal boron nitride and magnesium boron nitride at a temperature of at least 1350° C. under pressure at which the cubic boron nitride is thermodynamically stable, said magnesium boron nitride having lattice spacings obtained from the major x-ray diffraction lines thereof as designated in Table 2 of the specification.

4,409,194
METHOD OF SEPARATING MAGNESIUM FROM WET PROCESS SUPERPHOSPHORIC ACID

Alfred W. Petersen, Salt Lake City, Utah, assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 969,746, Dec. 14, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,981
Int. Cl.³ C01B 25/16
U.S. Cl. 423—321 R 2 Claims

1. A process for separating soluble magnesium from wet process superphosphoric acid containing (1) about 62 to about 72 percent by weight P_2O_5 with about 10 to about 45 percent

of the P_2O_5 in polyphosphate form, and (2) about 0.5 to about 3.0 pecent by weight MgO comprising the steps of aging said acid from about 4 to about 180 hours at a temperature of about 85° to about 180° C. with intermittent agitation of about 0.4 to about 50 percent of the aging time period followed by the step of filtering the aged superphosphoric acid at a temperature of about 85° to about 180° C.

4,409,195

PURIFICATION OF SILICON SOURCE MATERIALS

Robert D. Darnell, and William M. Ingle, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 273,519, Jun. 15, 1981, Pat. No. 4,374,110. This application Aug. 19, 1982, Ser. No. 409,391

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.³ C01B *33/107*

U.S. Cl. 423—342 **11 Claims**

1. A process for removing dopant impurity including one or more of boron, phosphorous, arsenic and aluminum in the form of chlorides, hydrides, or intermediate compounds containing both hydrogen and chlorine from a silicon source material including trichlorosilane or dichlorosilane which comprises the steps of: heating said material in gaseous form to a temperature between about 170° C. and about 500° C. with oxygen to form impurity containing siloxane complexes; and separating said complexes from said source material.

4,409,196

SYNTHESIS GAS FOR AMMONIA PRODUCTION

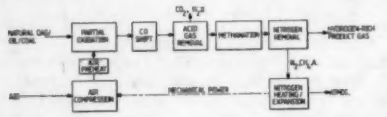
Geoffrey F. Skinner, Maidenhead, and Wieslaw M. Kowal, Henley, both of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 138,625, Apr. 8, 1980, abandoned. This application Feb. 5, 1981, Ser. No. 231,816

Claims priority, application United Kingdom, Apr. 24, 1979, 7914200; Apr. 23, 1980, 8013446

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—359 **11 Claims**



1. A process for producing a feed gas stream for the synthesis of ammonia which comprises:

(a) partially oxidising a substance selected from the group consisting of oil, coal, natural gas or any combination thereof in the presence of air at a pressure of 15 to 150 bar and at a temperature of 300° to 2000° C. to produce a raw gas stream containing hydrogen and nitrogen with a stoichiometric excess of nitrogen of at least 200 mole percent based upon that needed for ammonia synthesis, together with carbon oxides, methane and hydrogen sulphide if sulphur was present in the oil, coal or gas,

(b) treating the raw gas stream from step (a) to remove substantially all component gases other than hydrogen and nitrogen,

(c) drying the raw gas stream from step (b) if water is present,

(d) subjecting the raw gas stream from step (c) at a pressure of 15 to 100 bar to a separation stage to separate (1) a hydrogen-nitrogen feed gas stream at a pressure of 15 to 100 bar, said feed gas stream having a predetermined nitrogen:hydrogen ratio suitable for ammonia synthesis, and (2) a nitrogen-rich gas stream at a pressure of 5 to 50 bar,

(e) injecting said hydrogen-nitrogen feed gas stream from step (d) into a reactor for ammonia synthesis,

(f) heating said nitrogen-rich gas stream from step (d), still at a pressure of 5 to 50 bar, to a temperature of 500° to 2000° C., and

(g) expanding said high pressure nitrogen-rich gas stream from step (f) in a turbine to generate power.

4,409,197

PROCESS FOR PRODUCING SODIUM PERCARBONATE

Junichiro Sugano, Nagoya; Tomoyuki Yui, Yokkaichi; Yoshitugu Minamikawa, Yokkaichi; Tsuneo Fujimoto, Yokkaichi, and Minoru Kubota, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

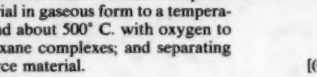
Filed Oct. 27, 1981, Ser. No. 315,645

Claims priority, application Japan, Oct. 27, 1980, 55-150502

Int. Cl.³ C01B *31/00, 15/30*

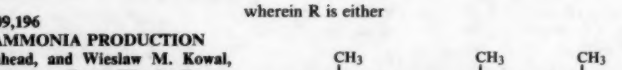
U.S. Cl. 423—415 P **4 Claims**

1. A process for the continuous production of sodium percarbonate which consists essentially of reacting sodium carbonate with hydrogen peroxide in a working solution of sodium carbonate, hydrogen peroxide and water, said reaction being carried out in the presence of two stabilizers, one selected from the group consisting of N, N, N′,N′-tetra(phosphonomethyl)diaminoalkane of the following formula



(A)

wherein R is either



and n is 0 or 1 to 4, mixtures thereof and the other salt selected from the group consisting of phosphates, silicates and magnesium salts and mixtures thereof, wherein said N,N,N′,N′-tetra(-phosphonomethyl)diaminoalkane is present in an amount of at least 100 ppm based on the working solution and wherein the phosphate, silicate or magnesium salt are added in amounts of 0.1 to 2.0% by weight, 0.5 to 5.0% by weight, or 0.1 to 1.0% by weight, respectively, based on the weight of the sodium carbonate reactant.

4,409,198

PROCESS FOR THE PRODUCTION OF COPPER (II) CHLORIDE FROM COPPER (II) OXYCHLORIDE USING TERTIARY AMINE HYDROCHLORIDES

Alfred Coenen, Maria Laach; Manfred Schroeder, and Guenter Prominski, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls, AG, Marl, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,009

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130810

Int. Cl.³ C01G *3/05*

U.S. Cl. 423—462 **10 Claims**

1. A process for preparing copper(II) chloride from copper-(II) oxychloride, comprising reacting an aqueous slurry of copper(II) oxychloride with the hydrochloride of a tertiary amine in an organic nonpolar solvent,

wherein the tertiary amine has 12–40 carbon atoms in total, contains at most one methyl group directly linked to the nitrogen atom and has a dissociation constant K_a of the equilibrium rection

$$NR_3H\oplus + H_2O \rightleftarrows NR_3 + H_3O\oplus$$

which is $10^{-3.5}$ to $10^{-8.5}$.

10. A cyclic oxychlorination process comprising chlorinating a compound by reaction with $Cu(II)Cl_2$, thereby converting the latter to Cu(I)Cl;

reacting the resultant Cu(I)Cl with oxygen to form $Cu_2(II)OCl_2$; and

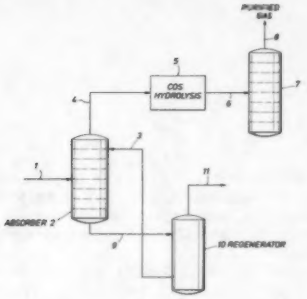
reacting the latter with the hydrochloride of a tertiary amine in accordance with claim 1 to regenerate $Cu(II)Cl_2$.

4,409,199

REMOVAL OF H_2S AND COS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1981, Ser. No. 330,048
Int. Cl.³ B01D *53/34;* C01B *17/04*
U.S. Cl. 423—573 G 13 Claims



1. A process for the removal of H_2S and COS from a sour gaseous stream containing H_2S and COS comprising:

a. contacting the sour gaseous stream in an absorption zone with an aqueous absorbent under conditions to absorb the bulk of the H_2S, and producing a product gas stream containing a reduced H_2S concentration and COS, and a loaded absorbent mixture;

b. contacting the product gas stream containing COS with a catalyst for the hydrolysis of COS, in the presence of water, and under conditions to react COS and water, and producing a gas stream containing CO_2 and H_2S;

c. removing H_2S from the gas stream by contacting the gas stream in a first contact zone with an aqueous oxidizing reactant solution which comprises an effective amount of an oxidizing reactant, at a temperature below the melting point of sulfur, and producing a purified gaseous stream and a reactant solution containing sulfur and reduced reactant;

d. concomitantly removing loaded absorbent mixture from the absorption zone, and regenerating the loaded absorbent to produce an acid gas stream comprising H_2S, and a regenerated absorbent;

e. and returning regenerated absorbent to the absorption zone.

4,409,200

REVERSE TRANSCRIPTASE FROM HUMAN MILK, METHOD FOR ITS PURIFICATION, AND ITS USE IN THE DETECTION OF BREAST CANCER

William F. Feller, Bethesda; Judith A. Kantor; Jack G. Chirikjian, both of Rockville, all of Md., and Terence M. Phillips, Washington, D.C., assignors to Research Corporation, New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,326
Int. Cl.³ G01N *33/56, 33/58*
U.S. Cl. 436—516 24 Claims

1. A method for diagnosing mammalian breast cancer by detecting, in a physiological fluid of said mammal, antibodies having immuno-reactivity towards human reverse transcriptase, which comprises:

mixing a sample of said fluid containing said antibodies with an excess of reverse transcriptase substantially purified having a molecular weight of about 70,000 and a sedimentation coefficient on a glycerol gradient of between 5 and 5.5 S, and being capable of binding to said antibody and of forming a complex therewith, and;

detecting said complex.

4,409,201

PRESSURE-RESISTANT MICROCAPSULES WITH A POLYAMIDE SHELL AND A POLYURETHANE-POLYUREA INNER MASS AND PROCESS FOR THEIR MANUFACTURE

Rudolf Heinrich, Kelkheim; Heinz Frensch, Frankfurt am Main, and Konrad Albrecht, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,386
Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020781
Int. Cl.³ A61K *9/50, 9/58;* B01J *13/02*
U.S. Cl. 424—32 18 Claims

1. A pressure-resistant microcapsule comprising a single shell consisting essentially of a polyamide, a structured mass of a polyurethane-polyurea polymer occupying the volume within said shell, and an encapsulated water-immiscible liquid phase.

4. A microcapsule as in claim 1 wherein said encapsulated liquid phase comprises a pesticidally active compound.

4,409,202

BREATH FRESHENER COMPOSITION AND METHOD

Frank Witzel, Spring Valley; Mario A. DiNolfo, Ossining, both of N.Y.; Burton Rodney, Lawrenceville, N.J., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 137,944, Apr. 7, 1980, Pat. No. 4,303,648.
This application Jul. 16, 1981, Ser. No. 283,772
The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.
Int. Cl.³ A61K *33/06, 33/08, 33/10*
U.S. Cl. 424—49 11 Claims

1. A breath freshener candy composition consisting essentially of a combination of vegetable oil and a substrate comprising magnesium hydroxide or the basic hydrated form of magnesium carbonate, dispersed in a non-toxic candy carrier, said vegetable oil being present in the weight ratio to the substrate of within the range of from about 0.1:1 to about 0.35:1.

4,409,203

NON-NITROCELLULOSE NON-FORMALDEHYDE OR FORMALDEHYDE RESIN NAIL POLISH EMPLOYING AN ACRYLATE RESIN AS THE FILM FORMER

Harry W. Gordon, and Nanette R. Avila, both of New York, N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 132,504, Mar. 21, 1980, abandoned. This application May 13, 1982, Ser. No. 377,620
Int. Cl.³ A61K *7/04*
U.S. Cl. 424—61 7 Claims

1. A liquid nail polish for application to human nails, said polish constituting a liquid composition consisting essentially of: from about 10% to about 25% of a methacrylate homopolymer having a molecular weight of about 25,000 as the principal film-forming constituent, selected from the group consisting of methyl methacrylate, ethyl methacrylate, butyl methacrylate and isobutyl methacrylate homopolymers, from about 0.5% to about 6.0% of cellulose acetate proprionate, from about 2% to about 6% of acetyl tributyl citrate, from about 2% to about 6% of a mixture of sucrose esters, and from about 0% to about 3% of camphor, all the foregoing percentages being based upon the weight of the liquid nail polish, said polish being free of nitrocellulose and of formaldehyde and formaldehyde resins, said polish also including an organic volatile solvent in which the homopolymer is dissolved, selected from the group consist-

ing of isopropyl alcohol, ethyl acetate, butyl acetate, methyl ethyl ketone, acetone, amyl acetate, methyl acetate, ethanol, Cellosolve, toluene, xylene and mixtures thereof, and being essentially water free.

4,409,204

MEANS FOR THE AFTERTREATMENT OF PERMANENTLY DEFORMED HAIR

Günther Lang, Niederbeerbach, and Theodor Wajaroff, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,866

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912427

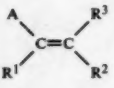
Int. Cl.³ A61K *7/06, 7/09, 7/11*

U.S. Cl. 424—70 **6 Claims**

1. A composition for the aftertreatment of permanently deformed hair comprising

A. from about 0.1 to 10.0 weight percent of glyoxylic acid,

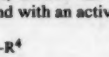
B. from about 0.1 to 10.0 weight percent of at least one organic compound having an aliphatic multiple carbon-carbon bond selected from the group consisting of (a) a compound of the formula



in which R^1, R^2 and R^3 are independently H, CN, COOM with M being H, Li, Na, K and NH_4, COOR′ with R′ being C_6H_5, C_1–C_6 alkyl, CONR′$_2$, and

and wherein A represents COOM and CH_2COOM, M having the meaning noted above, provided that A signifies CH_2COOM only when at least one of R^1, R^2 and R^3 is CN, COOM, COOR′ and CONR′$_2$ and

(b) a compound with an activated triple bond of the formula



in which R^4 is H, CN, COOM with M being H, Li, Na, K and NH_4, COOR′ with R′ being C_6H_5, C_1–C_6 alkyl, CONR′$_2$, and

and wherein A represents COOM and CH_2COOM, M having the meaning noted above, provided that A signifies CH_2COOM only when R^4 is CN, COOM, COOR′, CONR′$_2$ and

C. water.

4,409,205

OPHTHALMIC SOLUTION

Charles D. Shively, Highland Park, Ill., assignor to Cooper Laboratories, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 17,372, Mar. 5, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,853

Int. Cl.³ A61K *31/74*

U.S. Cl. 424—78 **9 Claims**

1. An ophthalmic solution for use in normalizing irregularly structured tear films in mammalian eyes having an ionic salt ion content within the range of from about 0.01% to about 0.75% expressed as sodium chloride equivalents, and a viscosity within the range of from about 1 cps to 150 cps at 23° C., comprising an aqueous solution of a water soluble non-ionic synthetic polymer having a molecular weight within the range of from about 300 to about 250,000 and selected from the group consisting of polyvinyl alcohol, polyethylene glycol and mixtures thereof, and from about 0.1 to about 5.0% of a non-ionic tonicity adjusting agent selected from the group consisting of mannitol, sorbitol, dextrose, sucrose, urea, glycerol and mixtures thereof.

4,409,206

TRANSDERMAL RELEASE SYSTEM FOR PHARMACEUTICAL PREPARATION

Herbert Stricker, Stettiner, Fed. Rep. of Germany, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 145,839, May 1, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,882

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920500

Int. Cl.³ A61K *31/78, 9/70;* **A61L** *15/03*

U.S. Cl. 424—81 **24 Claims**

1. A method for preparing a pharmaceutical preparation for transdermal application which comprises the steps of:

(a) pouring unto a flat, contained surface a polyacrylate dispersion or suspension comprising (i) from about 10 to 80% by weight of skin-compatible polyacrylate material selected from the group consisting of polymers or copolymers of acrylic acid, methacrylic acid, acrylic acid and methacrylic acid, alkyl esters thereof, and acrylonitrile, (ii) from about 20 to 90% by weight of water or a suitable solvent, and (iii) from 0 to about 30% by weight of hydrophilic substance selected from the group consisting of polyethylene glycol, glycerin, sorbitol, and mixtures thereof;

(b) allowing the water or organic solvent to evaporate from the polyacrylate dispersion or suspension of step (a) to form a dry polyacrylate film;

(c) contacting one or both surfaces of the polyacrylate film from step (b) one or more times with an organic solution or suspension of a pharmaceutically active substance selected from the group consisting of antihypertonics, tranquilizers, coronary drugs, migraine drugs, corticoids, contraceptives, analgesics, antirheumatics, and anticholinergics; and

(d) allowing the organic solvent or suspension agent to evaporate from the polyacrylate film of step (c) to form a polyacrylate film comprising pharmaceutically active substance in amorphous form,

the resulting polyacrylate film having a thickness of from about 10 to 500 μm.

4,409,207

DERIVATIVES OF CLAVULANIC ACID, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Brian C. Gasson, Redhill, England, assignor to Beecham Group Limited, England

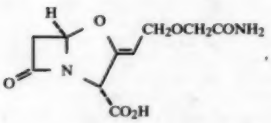
Division of Ser. No. 973,749, Dec. 26, 1978, Pat. No. 4,314,941. This application May 11, 1981, Ser. No. 262,119

Claims priority, application United Kingdom, Jan. 26, 1978, 03129/78

Int. Cl.³ A61K *35/00*

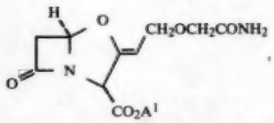
U.S. Cl. 424—114 38 Claims

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a compound of the formula (I):

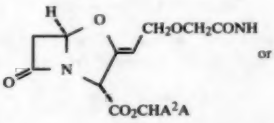


(I)

a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof of the formula (II), (III) or (IV):

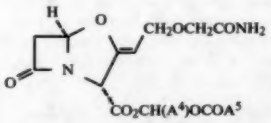


(II)



(III)

or



(IV)

wherein A^1 is alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms, alkynyl of up to 4 carbon atoms or alkyl of up to 4 carbon atoms mono-substituted by halogen, hydroxyl, alkoxyl or alkanoyloxy of up to 4 carbon atoms, acetyl or benzoyl; A^2 is hydrogen, phenyl, chlorophenyl, methoxyphenyl, bromophenyl or nitrophenyl; A^3 is phenyl, chlorophenyl, methoxyphenyl, bromophenyl or nitrophenyl; A^4 is hydrogen or methyl; and A^5 is alkyl or alkoxyl of up to 4 carbon atoms, phenyl or benzyl, or A^4 is attached to A^5 to form a phenyl ring, and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,409,208

GNRH ANTAGONISTS

Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 140,487, Apr. 15, 1980, Pat. No. 4,292,313, and Ser. No. 182,594, Aug. 29, 1980, abandoned. This application Apr. 21, 1981, Ser. No. 256,063

The portion of the term of this patent subsequent to Sep. 29, 1998, has been disclaimed.

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 16 Claims

1. A peptide or a nontoxic salt thereof, said peptide having the formula:

X-R_1-R_2-R_3-Ser-Tyr-R_4-R_5-Arg-Pro-R_6

wherein X is hydrogen or an acyl group having 7 or less carbon atoms; R_1 is dehydro Pro or dehydro D-Pro; R_2 is D-Phe, Cl-D-Phe, dichloro-D-Phe, CF_3-D-Phe, F-D-Phe, difluoro-D-Phe, AcNH-D-Phe, NO_2-D-Phe, dinitro-D-Phe, Br-D-Phe, dibromo-D-Phe, CH_3-S-D-Phe, OCH_3-D-Phe or CH_3-D-Phe; R_3 is D-Trp or β-(naphthyl)-D-Ala; R_4 is selected from the group consisting of β-(naphthyl)-D-Ala, D-Trp, imBzl-D-His, D-Leu and D-Ser(O-tBut); R_5 is Leu or N^{α}Me-Leu; and R_6 is Gly-NH_2 or $NHCH_2CH_3$; provided however that either R_3 or R_4 is β-(naphthyl)-D-Ala.

4,409,209

NOVEL PHOSPHORYLMURAMYL PEPTIDES AND PROCESSES FOR THE MANUFACTURE THEREOF

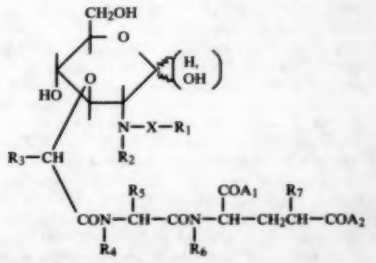
Gerhard Baschang, Bettingen, Switzerland; Lajos Tarcsay, Grenzach-Wyhlen; Albert Hartmann, Grenzach, both of Fed. Rep. of Germany, and Jaroslav Stanek, Birsfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 194,104, Oct. 6, 1980, Pat. No. 4,323,560. This application Dec. 4, 1981, Ser. No. 327,381

Int. Cl.³ A61K *37/00*

U.S. Cl. 424—177 27 Claims

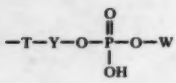
1. Pharmaceutical preparation with antiobiotic activity for parenteral or enteral administration which contains an antibiotically effective combination of at least one antibiotic and an amount sufficient to enhance the activity of said antibiotic of at least one phosphorylmuramyl peptide of the formula



(I)

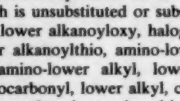
wherein X represents carbonyl, R_1 represents lower alkyl unsubstituted or substituted by hydroxy, lower alkoxy or halogen, or represents phenyl unsubstituted or substituted by hydroxy, lower alkoxy, lower alkyl or halogen, R_2, R_4 or R_6 independently of one another represent hydrogen or lower alkyl, R_3 represents hydrogen or lower alkyl, R_5 represents hydrogen, lower alkyl having from 1 to 3 carbon atoms unsubstituted or substituted by hydroxy, lower alkoxy, mercapto, lower alkylthio, amino or halogen, or represents cycloalkyl or cycloalkyl-lower alkyl in which the lower alkyl radical contains from 1 to 3 carbon atoms, and in each of which the cycloalkyl radical contains from 4 to 6 carbon atoms, phenyl or phenyl-lower alkyl having from 1 to 3 carbon atoms in the

lower alkyl radical and each unsubstituted or substituted by hydroxy, lower alkoxy or halogen, or heterocyclyl or heterocyclyl-lower alkyl having from 1 to 3 carbon atoms in the lower alkyl radical, and each containing one or two nitrogen atoms and having 5 or 6 ring members, or R_4 and R_5 together alternatively represent alkylene having 3 to 4 carbon atoms, R_7 represents hydrogen, and one of the radicals A_1 and A_2 represents a radical of the formula



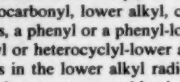
(II)

in which T represents HN or O, Y represents lower alkylene which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylthio, lower alkanoylthio, amino-lower alkyl, mono- or di- lower alkylamino-lower alkyl, lower alkanoylamino-lower alkyl, aminocarbonyl, lower alkyl, cycloalkyl having 5 or 6 carbon atoms, a phenyl or a phenyl-lower alkyl radical, or by heterocyclyl or heterocyclyl-lower alkyl having from 1 to 3 carbon atoms in the lower alkyl radical and each containing one or two nitrogen atoms and having 5 or 6 ring members or a radical of one of the formulae

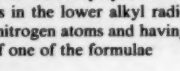


(IIIa)

(IIIb)



(IIIc)



(IIId)

in which Y_1 and Y_2 each represents lower alkylene which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylthio, lower alkanoylthio, amino-lower alkyl, mono- or di-lower alkylamino-lower alkyl, lower alkanoylamino-lower alkyl, aminocarbonyl, lower alkyl, cycloalkyl having 5 or 6 carbon atoms, a phenyl or a phenyl-lower alkyl radical, or by heterocyclyl or heterocyclyl-lower alkyl having from 1 to 3 carbon atoms in the lower alkyl radical and each containing one or two nitrogen atoms and having 5 or 6 ring members and R_8 represents hydrogen, W represents an alkyl or alkenyl group having from 7 to 30 carbon atoms which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, amino, lower alkylamino, lower alkanoylamino or oxo or represents a cycloalkyl or cycloalkenyl radical having from 10 to 30 carbon atoms which is unsubstituted or substituted by one or more alkyl radicals having from 1 to 8 carbon atoms, and the other of the radicals A_1 and A_2 represents hydroxy, lower alkoxy, amino or lower alkylamino, or represents aminocarbonyl-lower alkylamino unsubstituted or substituted in the lower alkyl radical by hydroxy, carboxy or amino groups, or a pharmaceutically acceptable salt thereof together with a significant amount of a pharmaceutically acceptable carrier.

4,409,210

ANTIBIOTIC COMPOUND

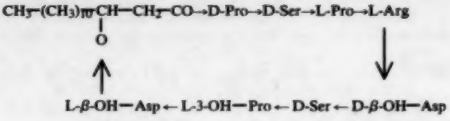
Hiroshi Kawaguchi, Tokyo; Masataka Konishi, Yokohama; Koko Sugawara, Wako, and Koji Tomita, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,355

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **4 Claims**

1. The peptide antibiotic compound Bu-2517 of the formula



or a pharmaceutically acceptable salt thereof, wherein Pro represents proline, Ser represents serine, Arg represents arginine, β-OH-Asp represents threo-β-hydroxyaspartic acid and 3-OH-Pro represents trans-3-hydroxyproline.

4,409,211

SYSTEMIC CONTROL OF INSECT INFESTATIONS IN ANIMALS BY USE OF O,O-DIMETHYL-2,2,2-TRICHLORO-2-(TETRAHYDROPYRANYL-2-OXY)ETHYLPHOSPHONATE

Ashley H. Freiberg, Santa Clara, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 220,941, Dec. 29, 1980, Pat. No. 4,320,123. This application Mar. 15, 1982, Ser. No. 356,531

Int. Cl.³ A61K *31/665*; C07D *309/06*

U.S. Cl. 424—203 **4 Claims**

1. A method of killig insect larvae in an animal having an opening infested with said larvae comprising administering an insecticide effective amount of O,O-dimethyl-2,2,2-trichloro-1-(pyranyl-2-oxy)ethylphosphonate to said animal at a site remote from the infested opening.

4,409,212

METHOD OF PREVENTING AND TREATING CEREBRAL INSUFFICIENCY

Cesare Mondadori, Don Mills, Canada, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

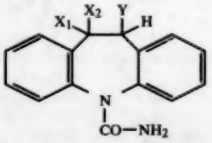
Filed Apr. 9, 1982, Ser. No. 366,792

Claims priority, application Switzerland, Apr. 16, 1981, 2565/81

Int. Cl.³ A61K *31/33*

U.S. Cl. 424—244 **8 Claims**

1. A method of preventing or treating imparied memory conditions comprising administering to a human being in need of such treatment, orally or rectally, a prophylactic or a therapeutically effective amount of a compound of the general formula



wherein X_1 is hydrogen, halogen having an atomic number up to 35, or is cyano, and X_2 and Y together are an additional bond, or X_1 and X_2 together are the oxo radical and Y is hydrogen, or X_1 is hydroxy and X_2 and Y are hydrogen.

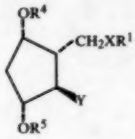
4,409,213

PROSTANOID COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Eric W. Collington, Welwyn; Harry Finch, Hitchin; Roger F. Newton, Melbourn, and Christopher J. Wallis, Royston, all of England, assignors to Glaxo Group Limited, England

Continuation of Ser. No. 232,363, Feb. 6, 1981, abandoned, which is a division of Ser. No. 56,416, Jul. 10, 1979, Pat. No. 4,265,891. This application Nov. 10, 1982, Ser. No. 440,622
Claims priority, application United Kingdom, Jul. 11, 1978, 29403/78
Int. Cl.³ A61K *31/55, 31/557;* C07D *223/00, 295/14*
U.S. Cl. 424—244 7 Claims

1. Prostanoids of the general formula (1)



X is cis or trans —CH=CH— or $(CH_2)_2$—;

R^1 is straight or branched C_{1-7} alkyl bearing as a terminal substituent —$COOR^{10}$ where R^{10} is a hydrogen atom, C_{1-6} alkyl or C_{7-10} phenalkyl;

Y represents (i) —NR^2R^3 where R^2 and R^3 are the same or different and are each a hydrogen atom, phenalkyl having C_{1-7} alkyl portion or C_{1-10} alkyl, both alkyls being optionally substituted by one or more substituents —OR^7 (where R^7 is a hydrogen atom, C_{1-7} alkyl, phenyl or phenyalkyl having a C_{1-4} alkyl portion) or —NR^8R^9 (where R^8 and R^9 are the same or different and are each a hydrogen atom or C_{1-4} alkyl, or where —NR^8R^9 is a saturated heterocyclic amino group as defined below for Y); any phenyl group in R^2 or R^3 being optionally substituted by one or more C_{1-4} alkyl or trifluoromethyl groups; always provided that the total numbers of carbon atoms in the group —NR^2R^3 does not exceed 15;

or (ii) a saturated heterocyclic amino group selected from the group consisting of pyrrolidino, piperdino, morpholino, piperazino, thiamorpholino, 1-dioxothiamorpholino, homomorpholino, hexamethyleneimino, piperazino substituted at the second nitrogen atom by C_{1-7} alkyl or phenalkyl having a C_{1-4} alkyl portion, and piperidino which contains in the ring the group C(OH)R^6 (where R^6 is a hydrogen atom, C_{1-7} alkyl, phenyl, or phenalkyl having a C_{1-4} alkyl portion) and any of said groups substituted on the ring by one or more C_{1-4} alkyl groups;

R^4 is a hydrogen atom, C_{1-6} alkyl (optionally interrupted by one or two oxygen atoms), C_{3-6} alkenyl, C_{2-4} alkanoyl, phenalkanoyl having a C_{2-4} alkanoyl portion, phenyl or aralkyl selected from the group consisting of benzyhydryl, naphthyl (C_{1-3}) alkyl and phen(C_{1-3}) alkyl and any one of said aryl groups substituted by one or more halogen, hydroxy, C_{1-6} alkyl C_{1-6} alkoxy, C_{1-4} hydroxyalkoxy, trifluoromethyl, cyano, phenyl, phenoxy, C_{5-7} cycloalkyl, phenalkoxy dimethylaminomethyl, carboxamido (—$CONH_2$), thiocarboxamido (—$CSNH_2$), C_{1-4} alkanoyl or —NR^8R^9 groups as defined above);

R^5 is as defined above for R^4, excluding phenyl;

and the physiologically acceptable salts thereof; provided that when both R^4 and R^5 are hydrogen atoms and Y is the group —NR^2R^3 in which R^2 is a hydrogen atom or C_{1-4} alkyl, R^3 is not an alkyl group which is only substituted by a hydroxy group.

7. A pharmaceutical composition comprising bronchodilating or blood platelet aggregation-inhibiting effective amount of a compound as claimed in claim 1 and one or more pharmaceutical carriers.

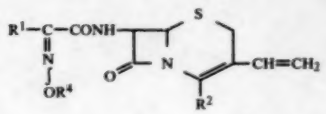
4,409,214

7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical, Co., Ltd., Osaka, Japan

Filed Nov. 10, 1980, Ser. No. 205,334
Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991; Jul. 14, 1980, 8022920
Int. Cl.³ A61K *31/545;* C07D *501/34*
U.S. Cl. 424—246 12 Claims

1. A compound of the formula:



in which

R^1 is 2-aminothiazol-4-yl or 2-acylaminothiazol-4-yl,

R^2 is carboxy or a protected carboxy group, and

R^4 is lower alkyl substituted by carboxy or a protected carboxy group,

and a pharmaceutically acceptable salt thereof.

7. A compound of claim 1, in which

R^2 is mono- or di- or triphenyl(lower)alkoxycarbonyl, or lower alkanoyloxy(lower)alkoxycarbonyl.

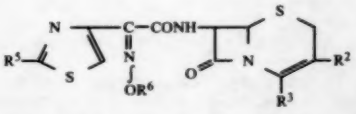
4,409,215

7-ACYLAMINO-3-SUBSTITUTED CEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohama-nishi; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Sumiyoshi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 14, 1980, Ser. No. 206,831
Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991
Int. Cl.³ A61K *31/545;* C07D *501/20*
U.S. Cl. 424—246 6 Claims

1. A compound of the formula:



in which

R^5 is amino or a protected amino group,

R^2 is methoxymethyl,

R^3 is carboxy or a protected carboxy group, and

R^6 is lower alkyl, and a pharmaceutically acceptable salt thereof.

6. A method for treating an infectious disease caused by pathogenic microorganisms, which comprises administering an antimicrobially effective amount of a compound of the claim 1 to infected human being and animals.

4,409,216
METHOD OF TREATING DIABETES USING OXAZOLINE OR THIAZOLINE COMPOUNDS

Barrie C. C. Cantello, Redhill, England, assignor to Beecham Group Limited, England

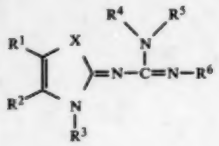
Filed Apr. 11, 1980, Ser. No. 139,284

Claims priority, application United Kingdom, Apr. 20, 1979, 7913864

Int. Cl.³ A61K *31/42, 31/425, 31/535, 31/54*

U.S. Cl. 424—246 **2 Claims**

1. A method for the treatment of diabetes in humans which comprises administering to the humans a therapeutically effective amount of an active compound of formula (II) or a pharmaceutically acceptable acid addition salt thereof:



(II)

wherein X represents oxygen or sulphur; R^1 and R^2 are the same or different and represent hydrogen, halogen, C_{1-6} alkyl, phenyl, benzyl, C_{3-6} cycloalkyl, carbo-C_{1-6} alkoxy or carboxy or R^1 and R^2 represent the remaining members of a benzene ring; R^3 represents C_{1-6} alkyl, phenyl or benzyl; R^4 represents C_{1-6} alkyl; R^5 represents C_{1-6} alkyl, phenyl optionally substituted with up to 3 groups selected from halogen, C_{1-6} alkyl, and C_{1-6} alkoxy; or benzyl optionally substituted with up to 3 groups selected from halogen, C_{1-6} alkyl and C_{1-6} alkoxy; or R^4 and R^5 together represent the remaining members of a 5- or 6-membered ring optionally containing an oxygen, sulphur or additional nitrogen atom and being optionally substituted with C_{1-6} alkyl; and R^6 represents C_{1-6} alkyl, phenyl, optionally substituted with up to 3 groups selected from halogen, nitro-, amino-, trifluoromethyl, C_{1-6} alkyl and C_{1-6} alkoxy; or benzyl optionally substituted with up to 3 groups selected from halogen, C_{1-6} alkyl and C_{1-6} alkoxy.

4,409,217
CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, and Kiyoshi Tsuji, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 886,340, Mar. 14, 1978. This application Sep. 26, 1980, Ser. No. 190,970

Int. Cl.³ A61K *31/545;* **C07D** *501/59*

U.S. Cl. 424—246 **3 Claims**

1. A compound selected from the group consisting of:
4-nitrobenzyl 7-[2-(tert-butoxycarbonylmethoxyimino)-2-(2-formamidothiazol-4-yl)acetamido]-3-chloro-3-cephem-4-carboxylate (syn isomer),
7-[2-(tert-butoxycarbonylmethoxyimino-2-(2-formamidothiazol-4-yl)-acetamido]-3-chloro-3-cephem-4-carboxylic acid (syn isomer),
7-[2-(tert-butoxycarbonylmethoxyimino)-2-(2-aminothiazol-4-yl)-acetamino]-3-chloro-3-cephem-4-carboxylic acid (syn isomer), and
7-[2-carboxymethoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-chloro-3-cephem-4-carboxylic acid (syn isomer).

3. A pharmaceutical composition comprising an antimicrobially effective amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,409,218
ANALGESIC METHOD

Alan C. White, Windsor, and Gerald Bradley, Weybridge, both of England, assignors to John Wyeth and Brother Limited, Maidenhead, England

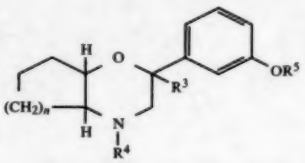
Filed Mar. 11, 1982, Ser. No. 357,027

Claims priority, application United Kingdom, Mar. 27, 1981, 8109713

Int. Cl.³ A61K *31/535*

U.S. Cl. 424—248.55 **1 Claim**

1. A method of treating a mammal in need of an analgesic which comprises administering to said mammal an analgesically effective amount of a 2R*,4aS*,8aS* morpholine derivative of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein n represents 1, 2 or 3; R^3 is alkyl of 1 to 10 carbon atoms; R^4 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, aryl(lower)alkyl, 2-tetrahydrofurylmethyl or cyclo(lower-)alkylmethyl; and OR^5 is hydroxy or acyloxy.

4,409,219
QUINOXALINE-1,4-DIOXIDE FODDER SUPPLIMENTS

Pal Benko; Daniel Bozsing; Jamos Gundel, and Karoly Magyar, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

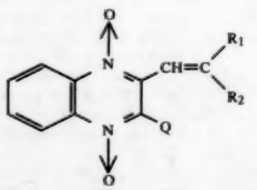
Filed May 22, 1981, Ser. No. 266,300

Claims priority, application Hungary, May 23, 1980, 1298/80

Int. Cl.³ C07D *403/12, 403/6, 341/12;* **A61K** *31/495*

U.S. Cl. 424—250 **8 Claims**

1. A compound of the formula (I)



(I)

wherein
Q is hydrogen or methyl;
R_1 is hydrogen, cyano, lower alkanoyl, nitro or halogen;
R_2 is cyano, lower alkanoyl, or a group of the formula —COOR₃, —CONR₄R₅, or —CONHNR₄R₅;
R_3 is hydrogen, C_1 to C_{18} alkyl, C_6 to C_{10} aryl, or C_6 to C_{10}aryl-($C_1$to C_4alkyl) which latter can be substituted with a halogen or a hydroxy group, and the aromatic ring of the said aryl groups can contain 1 to 3 substituents selected from the group consisting of lower alkyl or alkoxy, amino, nitro, halogen and hydroxy;
R_4 is hydrogen, C_1–C_{18}alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl, C_6 to C_{10} aryl, C_6 to C_{10}aryl-(C_1 to C_4alkyl) which can be substituted by a halogen or a hydroxy group, and the aromatic ring of said aryl groups can contain 1 to 3 substituents selected from the group consisting of lower alkoxy, lower alkyl, amino, nitro, halogen, and hydroxy, a lower alkylcarbonyl, a lower alkylsulfonyl, or a C_6 to C_{10} arylsulfonyl group which can be substi-

tuted by an amino or a lower alkyl group, or a mono- or bicyclic heterocyclic sulfonyl group wherein the heterocyclic group is selected from the group consisting of pyridyl, thiazolyl, isothiazolyl, pyrimidinyl, pyridazinyl, pyrazinyl, furyl, imidazolyl, oxazolyl, quinolyl, and isoquinolyl and wherein the heterocyclic group is unsubstituted or substituted by lower alkyl, halogen, hydroxy, lower alkoxy, nitro or amino;

R_5 is hydrogen, hydroxyethyl, dodecyl, 1,1-dimethylpropyn-2-yl, phenyl, 3,4,5-trimethoxy-phenyl, 2,6-dimethyl-phenyl, 2-pyridyl, p-amino-phenylsulfonyl, or methoxycarbonyl; or

R_4 and R_5 together with the adjacent nitrogen atom form a pyrolidino, piperidino, morpholino, piperazino, N-methyl-piperazino, N-ethyl-piperazino, N-phenyl-piperazino, or N-benzyl-piperazino, or in the case wherein R_2 is carboxy, a pharmaceutically acceptable basic carboxylate salt thereof, but when Q is hydrogen and R_2 is carboxy, R_1 is different from hydrogen.

6. An antimicrobial or weight-gain increasing veterinary composition containing a compound as defined in claim 1, together with a suitable insert, solid or liquid carrier or diluent.

4,409,220

FUSED-RING AMINO-PYRAZINES AS BRADYCARDIAC AGENTS

Rudolf Hurnaus; Gerhart Griss, both of Biberach; Robert Sauter, Laupheim; Wolfgang Grell, Biberach, all of Fed. Rep. of Germany; Walter Kobinger, and Ludwig Pichler, both of Vienna, Austria, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

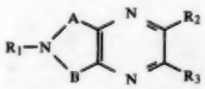
Filed Aug. 27, 1981, Ser. No. 297,024

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032994

Int. Cl.³ C07D *471/04, 487/04;* **A61K** *31/495, 31/55*

U.S. Cl. 424—250 **6 Claims**

1. A compound of the formula



wherein

one of A and B is methylene or (alkyl of 1 to 3 carbon atoms)—methylene, and the other is ethylene or (alkyl of 1 to 3 carbon atoms)—ethylene.

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, alkenyl of 3 to 6 carbon atoms, phenyl-(alkyl of 1 to 3 carbon atoms), halophenyl-(alkyl of 1 to 3 carbon atoms), alkanoyl of 1 to 3 carbon atoms, phenyl-(alkanoyl of 1 to 3 carbon atoms), halophenyl-(alkanoyl of 1 to 3 carbon atoms), alkoxycarbonyl of 2 to 4 carbon atoms, aralkoxycarbonyl of 8 to 10 carbon atoms or phenyl;

one of R_2 and R_3 is amino and the other is hydrogen, chlorine, bromine, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms, phenyl or halophenyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. A bradycardiac pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective bradycardiac amount of a compound of claim 1.

4,409,221

1,2,3,4,4A,9B-HEXAHYDRO-4A-PIPERAZINYLMETHYL-4-DIBENZOFURANONE OR -DIBENZOFURANOL DERIVATIVES

Michel Combourieu; Jean-Claude Laigle, both of Aurillac, and Norbert Busch, Manzat, all of France, assignors to Riom Laboratories - Cerm S.A., Riom, France

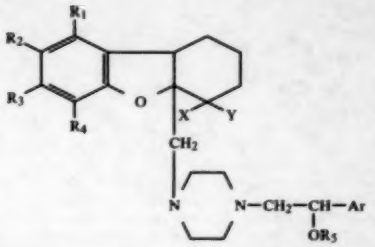
Filed Jun. 9, 1982, Ser. No. 386,621

Claims priority, application France, Jun. 12, 1981, 81 11672

Int. Cl.³ A61K *31/495;* **C07D** *405/00, 405/06, 307/81*

U.S. Cl. 424—250 **8 Claims**

1. A compound of the formula:



and pharmaceutically acceptable salts thereof, in which R_1, R_2, R_3 and R_4 are identical or different and represent hydrogen, halogen, lower alkyl or alkoxy or trifluoromethyl; R_5 represents hydrogen or lower alkyl, X represents hydrogen and Y represents hydroxy or X and Y together represent oxygen, and Ar represents an optionally substituted aromatic moiety, selected from the group consisting of phenyl or pyridyl optionally substituted with alkyl (1–4 C), alkoxy (1–4 C) or halogen.

4,409,222

PINACIDIL-DIURETIC PREPARATION FOR TREATING HYPERTENSION OR CONGESTIVE HEART FAILURE

Edoardo Arrigoni-Martelli, Birkerod, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiski Fabrik Produktionsaktieselskab), Ballerup, Denmark

Filed Mar. 31, 1982, Ser. No. 363,934

Claims priority, application United Kingdom, Apr. 15, 1981, 8111986

Int. Cl.³ A61K *31/505, 31/44*

U.S. Cl. 424—251 **14 Claims**

1. A pharmaceutical preparation for treating hypertension or congestive heart failure consisting essentially of an effective amount of a mixture of N''-cyano-N-4-pyridyl-N'-1,2,2-trimethylpropylguanidine and a diuretic, the two active components being used as such or, if appropriate, in the form of atoxic salts thereof.

13. A method for the treatment of hypertension or congestive heart failure in mammals, including man, comprising simultaneous administration to a host suffering from said illness a therapeutically acceptable amount of N''-cyano-N-4-pyridyl-N'-1,2,2-trimethylpropylguanidine and a therapeutically acceptable amount of a diuretic as specified in claim 1.

4,409,223

ANXIOLYTIC METHOD

Leslie A. Riblet, 832 Walnut, Mt. Vernon, Ind. 47620, and Michael S. Eison, 5487 Eden Dr., Evansville, both of Ind. 47715

Filed Aug. 6, 1982, Ser. No. 405,785

Int. Cl.³ A61K *31/495, 31/505*

U.S. Cl. 424—251 **3 Claims**

1. The process for ameliorating an anxiety state in a mammal in need of such treatment comprising systemic administration to said mammal of an effective but non-toxic anxiolytic dose of

1-(2-pyrimidinyl)piperazine or a pharmaceutically acceptable acid addition salt thereof.

4,409,224

PYRIMIDO[1,6-A]INDOLE DERIVATIVES

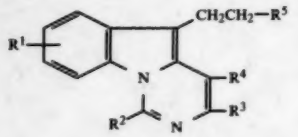
Ivo L. Jirkovsky, Montreal, Canada, assignor to American Home Products Corp., New York, N.Y.

Division of Ser. No. 941,816, Sep. 11, 1978, Pat. No. 4,307,234. This application Jul. 13, 1981, Ser. No. 282,575

Int. Cl.[3] **A61K** *505/00;* **C07D** *487/04, 491/14, 521/00*

U.S. Cl. 424—251 **35 Claims**

1. A compound of formula I



(I)

in which R^1 is hydrogen; R^2 is lower alkyl, cyclo(lower)alkyl,-pyrrolidin-1-ylmethyl or a radical of formula $—NR^6R^7$ wherein R^6 and R^7 each is lower alkyl; R^3 is hydrogen, lower alkyl or [4-(pyrrolidin-1-yl)-1,4-dioxobutyl]amino; R^4 is lower alkyl; and R^5 is bromo, chloro, lower alkoxy, 1-pyrrolidinylthloxomethylthio, 4,5-dihydro-1H-imidazol-2-ylthio, or a radical of formula $—NR^{14}R^{15}$ wherein R^{14} is lower alkyl and R^{15} is lower alkyl, or hydroxy(lower)alkyl, or R^{14} and R^{15} together form a chain of formula $—CH_2CH=CH—(CH_2)_2—$, $—(CH_2)_2—O—(CH_2)_2—$, $—(CH_2)_4—$, $—(CH_2)_5—$, $(CH_2)_6—$, $—(CH_2)_2—NR^{16}—(CH_2)_2—$ wherein R^{16} is lower alkyl or 4-(lower alkoxy)phenyl, $—(CH_2)_2—CHR^{17}—(CH_2)_2—$ wherein R^{17} is benzoylamino, $CH_2CHR^{18}OCHR^{19}CH_2$ wherein R^{18} and R^{19} each is lower alkyl, or $—CH=N—CH=CH—$, or a therapeutically acceptable acid addition salt thereof.

30. A method of treating hypertension in a mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of formula I, or a therapeutically acceptable acid addition salt thereof, as claimed in claim **1**.

4,409,225

SUBSTITUTED BENZAMIDES

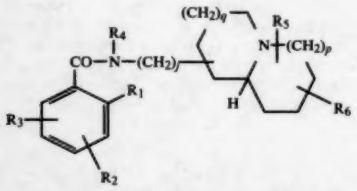
Michael S. Hadley, Sawbridgeworth, England, assignor to Beecham Group Limited, England

Filed Mar. 16, 1981, Ser. No. 243,762

Int. Cl.[3] **A61K** *31/435;* **C07D** *455/02*

U.S. Cl. 424—256 **8 Claims**

1. A compound of formula (I) and pharmaceutically acceptable salts thereof:



(I)

wherein:

R_1 is a C_{1-6} alkoxy group;

R_2 and R_3 are the same or different and are hydrogen. halogen, CF_3, C_{1-7} acyl, C_{1-7} acylamino, C_{1-6} alkyl-$S(O)_n$ wherein n is 0, 1 or 2, nitro, or amino, aminocarbonyl or aminosulphonyl optionally substituted by one or two C_{1-6} alkyl groups;

or R_1 and R_2 taken together are methylendioxy or ethylenedioxy in which case R_3 is any one of the groups given for R_1 and R_2 above;

R_4 is hydrogen or C_{1-6} alkyl;

R_5 is hydrogen, C_{1-6} alkyl, phenyl or phenyl-C_{1-6} alkyl, either of which phenyl moieties may be substituted by C_{1-6} alkyl, C_{1-6} alkoxy, CF_3 or halogen, and R_6 is hydrogen; and

j is 1 to 4; and

p is 1 and q is 1.

5. 4-Amino-5-chloro-2-methoxy-N-(3-quinolizidinylmethyl)-benzamide.

7. A pharmaceutical composition useful for treatment of disorders related to impaired gastric emptying, comprising a gastric emptying effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

8. A method of treating disorders related to impaired gastric emptying in humans and animals, which comprises administering to a human or animal in need thereof a gastric emptying effective amount of a compound according to claim **1**.

4,409,226

IMIDAZO[1,5-A]PYRIDINES

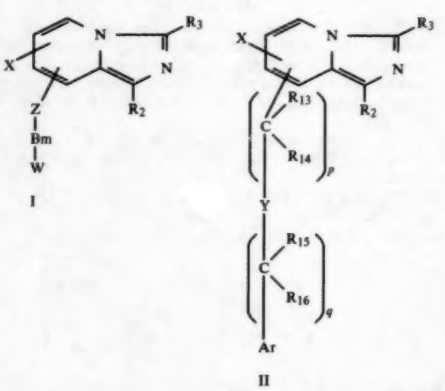
James A. Bristol, Ann Arbor, Mich., and Raymond G. Lovey, West Caldwell, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 5, 1981, Ser. No. 308,349

Int. Cl.[3] **A61K** *31/44;* **C07D** *471/04*

U.S. Cl. 424—256 **29 Claims**

1. A compound represented by the formulas:

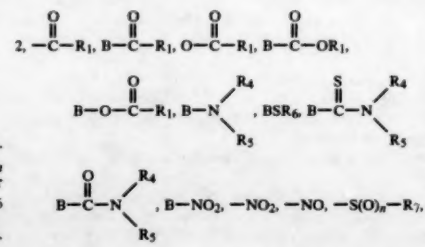


I

II

the 5,6,7,8-tetrahydro, and perhydro derivatives thereof, and the pharmaceutically acceptable salts thereof, wherein:

R_2 and R_3 each independently represent hydrogen, lower alkyl, trifluoromethyl, B-CF_3, B-Ar, carbocyclic aryl, pyridyl, halogen, B-halogen, B-OR_8, B-$S(O)_n$-lower alkyl, wherein (n) is 0,1, or



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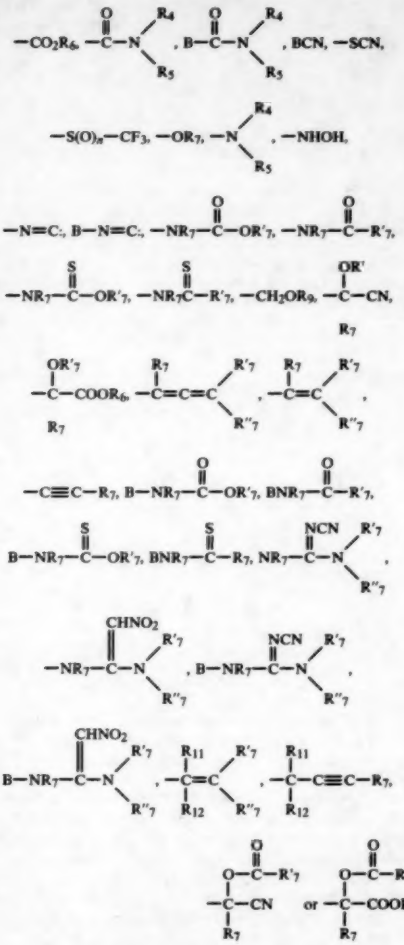
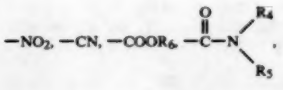


or a straight- or branched-chain alkenyl or alkynyl group having 2 to 6 bridging carbon atoms and aryl substituted derivatives thereof;

X represents hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy, trifluoromethyl,



wherein n is zero, one or two with the proviso that when R_1 represents

n represents two;

Z represents O, S, SO, SO_2, NR_6, or a bond connecting B to the 5-, 6-, 7-, or 8-position of the imidazo [1,5-a]pyridine nucleus;

B represents a straight-or branched-chain lower alkylene moiety;

B_m represents a straight-or branched-chain lower alkylene moiety and, when Z is a bond connecting B_m and the imidazo[1,5-1]pyridine nucleus, the $-OR_7$ derivatives thereof or the $\alpha(\beta)$-or $\beta(\gamma)$-unsaturated derivatives thereof;

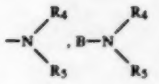
m is 1 to 10 with the proviso that when W is Ar, the number of bridging carbons between Z and W is no greater than 5;

W represents Ar wherein Ar represents phenyl, pyridyl, thienyl, imidazolyl, furanyl or X'-, Y'-, Z'-substituted-phenyl wherein each of X', Y', and Z' independently are as hereinabove defined for X; and when m is 1 to 3, W represents alkenyl, alkynyl, Z^1R_6 or Z^1COR_6 wherein Z^1 is S, SO, or SO_2;

Y represents O, S, SO, SO_2 or NR_6;

where in the above definitions:

R_1 represents Ar, lower alkyl,



or Ar-loweralkyl;

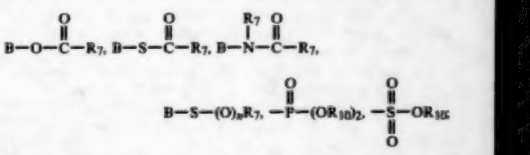
R_4 and R_5 each independently represent hydrogen, lower alkyl, Ar, Ar-loweralkyl, loweralkoxyloweralkyl, trifluoromethylloweralkyl, or when taken together with the nitrogen atoms to which they are attached form a 4-7 membered cyclic amino or a morpholino group;

R_6 represents hydrogen, C_1- to C_{12}-alkyl, aryl or an aralkyl group having up to 12 carbon atoms;

R_7, R' and R'' represent hydrogen or loweralkyl;

R_8 represents hydrogen, loweralkyl, loweralkoxyloweralkyl, trifluoromethylloweralkyl, Ar-loweralkyl, or Ar;

R_9 represents



R_{10} represents H, alkali metal or lower alkyl;

R_{11} and R_{12} each represents hydrogen or lower alkyl or together represent oxygen;

R_{13} and R_{14} each represent H, alkyl, aryl, or together represent —O— or —S—;

R_{15} and R_{16} each represent H, alkyl, aryl, or together represent —O— or —S—, provided that when R_{13} and R_{14} together represent —O— or —S—, R_{15} and R_{16} do not represent —O— or —S—;

p and q are each independently 0, 1 or 2 provided that when one of p and q is zero, the other is not zero; wherein for all variables other than W, Ar represents carbocyclic aryl.

18. A method for the treatment of the symptoms of peptic ulcer disease in mammals, which comprises administering to a mammal having peptic ulcer disease a therapeutically effective quantity of a compound of claim 1.

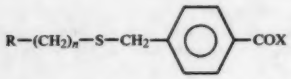
4,409,227

4-(((HETEROCYCLO)THIO)METHYL)BENZOIC ACIDS, ESTERS AND AMIDES AND THEIR PHARMACEUTICAL USE

Donald P. Matthews, Indianapolis, Ind., assignor to The Dow Chemical Co., Midland, Mich.

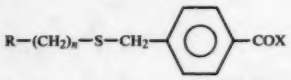
Division of Ser. No. 65,390, Aug. 9, 1979, Pat. No. 4,325,959.
This application Mar. 9, 1982, Ser. No. 355,788
Int. Cl.³ A61K 31/44; C07D 213/70
U.S. Cl. 424—263 42 Claims

1. A compound of the formula:



wherein R represents a substituted or unsubstituted heterocyclic moiety selected from the group consisting essentially of pyridinyl, thienyl, and 1,3,4-oxadiazolyl, said optional substitution on the heterocyclic ring being selected from a lower alkyl, halo, or hydroxy; X represents amino or an —OR^1 moiety wherein R^1 represents hydrogen or lower alkyl; and n represents the integer 0, 1, 2 or 3 or a pharmaceutically-acceptable salt of the acid.

14. A method for treating hyperglycemia in a mammal which comprises administering internally to a mammal an effective hypoglycemic amount of a compound of the formula:



wherein R represents a substituted or unsubstituted heterocyclic moiety selected from the group consisting essentially of pyridinyl, thienyl, and 1,3,4-oxadiazolyl, said optional substitution on the heterocyclic ring being selected from a lower alkyl, halo, or hydroxy; X represents amino or an —OR^1 moiety wherein R^1 represents hydrogen or lower alkyl; and n represents the integer 0, 1, 2 or 3 or a pharmaceutically-acceptable salt of the acid.

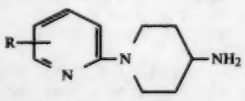
4,409,228

ANDREXIANT AMINOPIPERIDINES INTERMEDIATES THERETO AND DRUGS CONTAINING SAME

Dino Nisato, Pavia, and Paolo Carminati, Milan, both of Italy, assignors to Sanofi, France

Continuation of Ser. No. 159,603, Jun. 16, 1980, abandoned.
This application Dec. 3, 1981, Ser. No. 327,022
Claims priority, application France, Jun. 21, 1979, 79 15974
Int. Cl.³ A61K 31/445; C07D 401/04
U.S. Cl. 424—267 11 Claims

1. 4-amino-1-(2-pyridyl)piperidine of the formula:



in which R represents chlorine; bromine; a trifuluoromethyl group; a trifluoromethoxy group; a 2,2,2-trifluoroethoxy group; a lower alkylthio group; a trifluoromethylthio group; a phenoxy group; a phenoxy group substituted in the phenyl ring by a halogen, a trifluoromethyl group, a lower alkyl group, a lower alkoxy group, a lower alkylthio group or a cyano group; a phenylthio group; a phenylthio group substituted in the phenyl ring by a halogen, a trifluoromethyl group, a lower alkyl group, a lower alkoxy group, a lower alkylthio group or a cyano group; or a pharmaceutically acceptable salt thereof.

8. An anorectic pharmaceutical composition in dosage unit form comprising from 0.5 to 250 mg per dosage unit of a compound as claimed in claims 1 or 6 in admixture with a pharmaceutical carrier.

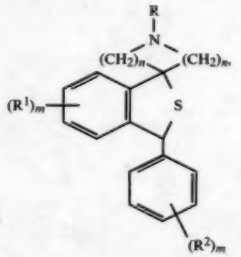
4,409,229

ANTIDEPRESSIVE AND TRANQUILIZING SUBSTITUTED 1,3-DIHYDROSPIRO[BENZO(C)THIOPHENE]S

Helen H. Ong, Whippany; Vernon B. Anderson, High Bridge, both of N.J., and James A. Profitt, Goshen, Ind., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 165,344, Jul. 2, 1980, abandoned, which is a continuation of Ser. No. 948,908, Oct. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 857,177, Dec. 2, 1977, abandoned. This application Oct. 20, 1981, Ser. No. 313,169
Int. Cl.³ A61K 31/445, 31/40; C07D 495/10
U.S. Cl. 424—267 37 Claims

1. A compound of the formula



or an optical antipode or pharmaceutically acceptable salt thereof in which R is hydrogen, loweralkyl, cycloalkylloweralkyl wherein the cycloalkyl portion contains from 3 to 6 carbon atoms, loweralkenyl, phenylloweralkyl, diphenylloweralkyl, or phenoxyloweralkyl; R^1 and R^2 are the same or different and each can be hydrogen, loweralkyl, loweralkoxy, trifluoromethyl, chlorine, bromine, fluorine, hydroxy, methylenedioxy or loweralkylthio, m, n and n′ are integers from 1to 3; and the sum of n and n′ is 3 or 4.

34. A method of treating depression which comprises administering to a patient an antidepressive amount of a compound defined in claim 1.

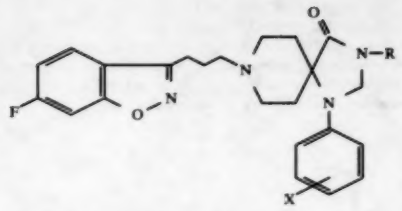
4,409,230

PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING 8-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-1-PHENYL-1,3,8-TRIAZASPIRO-[4.5]DECAN-4-ONE AND DERIVATIVES THEREOF

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 366,246, Apr. 9, 1982, Pat. No. 4,374,245.
This application Nov. 17, 1982, Ser. No. 442,340
Int. Cl.³ A61K 31/445
U.S. Cl. 424—267 4 Claims

1. A method of treating psychoses comprising administering to a mammal in need of psychoses treatment a psychoses treating effective amount of a compound of the formula



wherein R is hydrogen or loweralkyl; X is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; the optical antipods thereof, or pharmaceutically acceptable acid addition salts thereof.

4,409,231

SUBSTITUTED ARYLOXYAMINO PROPANOLS, AND PROCESS FOR THEIR USE

Wolfgang Stenzel, and Erich Cohnen, both of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf Aktiengeselischaft, Hamburg, Fed. Rep. of Germany

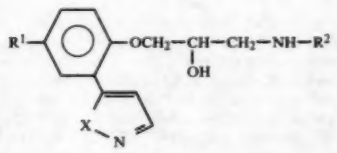
Filed Jun. 30, 1980, Ser. No. 164,214

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926517

Int. Cl.[3] A01N *31/415, 31/42;* C07D *263/32, 231/12*

U.S. Cl. 424—272 9 Claims

1. A compound of the formula



(I)

wherein X is selected from oxygen and an NH group, R^1 is selected from hydrogen, amino and acylamino having 1 to 8 carbon atoms, and R^2 is selected from isopropyl, tertiarybutyl, and 2-(3,4-dimethoxyphenethyl), and pharmaceutically acceptable acid addition salts thereof.

7. A method for lowering the blood pressure of a warm blooded animal comprising administering to said animal a therapeutically effective amount of the compound of claim 1.

4,409,232

SUBSTITUTED OXADIAZOLES, METHOD FOR THE PRODUCTION THEREOF, COMPOSITIONS CONTAINING THEM AND METHOD OF USE THEREOF

Erich Cohnen, Hamburg, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

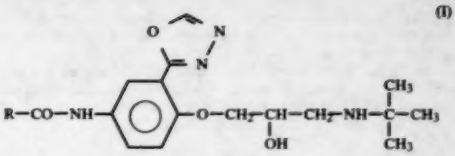
Filed Aug. 7, 1981, Ser. No. 290,952

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030530

Int. Cl.[3] C07D *271/10;* A61K *31/41*

U.S. Cl. 424—272 12 Claims

1. A compound of Formula I



(I)

wherein R is a straight or branched chain alkyl group having 1 to 17 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms, or the physiologically acceptable acid addition salts thereof.

9. A method of treating angina pectoris, hypertension, or arrythmia comprising administering an amount of a compound of claim 1 effective against said angina pectoris, hypertension, or arrythmia, to a warm blooded animal.

4,409,233

HIGHLY CONCENTRATED PREPARATIONS OF DOPA COMPOUNDS

Kazuhiro Tsukada, and Wataru Kato, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

PCT No. PCT/JP79/00174, § 371 Date Mar. 4, 1980, § 102(e) Date Sep. 17, 1979

PCT Filed Jul. 2, 1979, Ser. No. 262,065

Claims priority, application Japan, Jul. 4, 1978, 53-81285

Int. Cl.[3] A01N *37/13*

U.S. Cl. 424—273 R 16 Claims

1. A highly concentrated aqueous composition of a dopa which comprises a dopa and at least one amino acid selected from the group consisting of methionine, proline, hydroxyproline, serine, threonine, valine, arginine, lysine, histidine and ornithine, said composition having a concentration of said amino acid of 1–300 mg per ml of said aqueous composition.

16. A freeze-dried composition of a dopa which comprises a dopa and at least one amino acid selected from the group consisting of methionine, proline, hydroxyproline, serine, threonine, valine, arginine, lysine, histidine and ornithine, said composition having been prepared by freeze-drying a concentrated aqueous composition comprising said dopa and said amino acid in an amount of 1–300 mg per ml of said aqueous composition.

4,409,234

PYRAZOLOINDAZOLE DERIVATIVES AND BRONCHODILATING COMPOSITION

Yasuo Fujimura, Saitama; Sadao Tanaka, Tokyo; Isao Matsunaga, Tokyo; Yasuyuki Shiraki, Tokyo; Yugo Ikeda, Sayama; Tamotsu Yamazaki, Tokorozawa; Yasuhiro Ohba, Kawasaki; Shun-ichi Hata, Yokohama; Minoru Shindo, Tokyo, and Kazushige Sakai, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

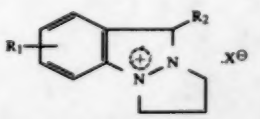
Continuation of Ser. No. 165,943, Jul. 3, 1980, abandoned. This application Jun. 3, 1982, Ser. No. 384,861

Claims priority, application Japan, Jul. 16, 1979, 54-89311

Int. Cl.[3] C07D *487/04;* A61K *31/415*

U.S. Cl. 424—273 N 23 Claims

1. A compound represented by the formula



wherein R_1 is a hydrogen atom, halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxyl group or benzyloxy group; R_2 is a hydrogen atom, a halogen atom, a lower

alkyl group or phenyl group (provided R_1 and R_2 are not hydrogen at the same time); and $X^{\ominus}$ is a halide ion, a hydroxide ion, a methanesulfonate ion, a p-toluenesulfonate ion, a sulfate ion, a nitrate ion, a carbonate ion, an acetate ion, a benzoate ion or a salicylate ion.

23. A bronchodilating composition comprising an amount effective for bronchodilation of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,409,235

SUBSTITUTED 7-(2,6-DIBROMO-4-METHYL-PHENYL)-2,3-DIHYDRO-IMIDAZO[1,2-A]IMIDAZOLES, COMPOSITIONS AND USE

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein, Fed. Rep. of Germany; Walter Kobinger, Vienna, Austria; Christian Lillie, Vienna, Austria, and Ludwig Pichler, Vienna, Austria, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Fed. Rep. of Germany

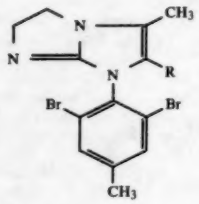
Continuation of Ser. No. 317,014, Nov. 2, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,538

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042636

Int. Cl.³ A61K *31/415;* **C07D** *487/04*

U.S. Cl. 424—273 R **5 Claims**

1. A compound of the formula



wherein R is hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. The method of lowering the heart rate of a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said warm-blooded animal an effective bradycardiac amount of a compound of claim 1.

4,409,236

N-SUBSTITUTED AZIRIDINE-2-CARBOXYLIC ACID DERIVATIVES AND IMMUNO-STIMULATION COMPOSITION AND METHOD

Elmar Bosies, Weinheim; Herbert Berger, Mannheim; Wolfgang Kampe, Heddesheim; Uwe Bicker, Mannheim, and Alfred Grafe, Mörlenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 59,863, Jul. 23, 1979, Pat. No. 4,321,194. This application Jun. 1, 1981, Ser. No. 268,964

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833986

Int. Cl.³ A61K *31/395;* **C07D** *203/08, 333/30*

U.S. Cl. 424—275 **4 Claims**

1. A 2-cyanoaziridine derivative of the formula

wherein

R' is a methyl, ethyl or n-propyl residue, substituted by a thienyl radical, the thienyl radical being optionally substituted by one carboxyl, methoxycarbonyl, ethoxycarbonyl or n-propoxycarbonyl,

or a pharmacologically acceptable salt thereof.

4. A method of stimulating an immune response in a patient which comprises administering to the patient an immunostimulating effective amount of an aziridine-2-carboxylic acid derivative or salt thereof according to claim 1.

4,409,237

PHARMACEUTICAL COMPOSITIONS CONTAINING SODIUM CHROMOGLYCATE AND β2 SELECTIVE BRONCHODILATORS

Hugh Cairns; Peter M. Greenhalgh, both of Loughborough, and Brian Howlett, Leicester, all of England, assignors to Fisons Limited, Ipswich, England

Filed Apr. 21, 1981, Ser. No. 256,021

Claims priority, application United Kingdom, Apr. 30, 1980, 8014197; Feb. 19, 1981, 8105306

Int. Cl.³ A61K *31/35*

U.S. Cl. 424—283 **12 Claims**

1. A pharmaceutical mixture comprising

(a) a therapeutically effective amount of one or more of 1,3-bis(2-carboxychromon-5-yloxy)propan-2-ol, or a pharmaceutically acceptable salt thereof, as active ingredient A, in combination with

(b) a therapeutically effective amount of one or more β2 selective bronchodilators, or a pharmaceutically acceptable salt thereof, in solid form, as active ingredient B.

4,409,238

INSECTICIDES AND INSECTICIDAL COMPOSITIONS

Fumio Mori, Kurashiki, and Yoshiaki Omura, Okayama, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

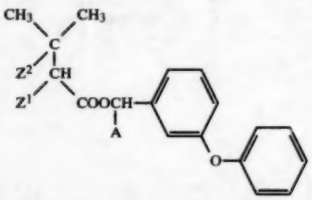
Continuation of Ser. No. 885,380, Mar. 10, 1979. This application Dec. 26, 1979, Ser. No. 107,390

Claims priority, application Japan, Mar. 11, 1977, 52-27510; Mar. 23, 1977, 52-32863; Apr. 5, 1977, 52-39237; Apr. 11, 1977, 52-41813

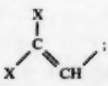
Int. Cl.³ A01N *9/20, 9/24;* **C07C** *69/65, 121/75*

U.S. Cl. 424—304 **53 Claims**

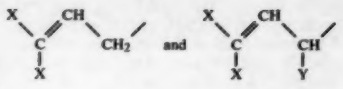
1. An insecticidal composition comprising (i) an insecticidally effective amount of an isovalerate having the structural formula:



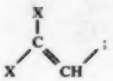
wherein Z^1 is a member selected from the group consisting of hydrogen and



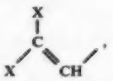
Z^2 is a member selected from the group consisting of



when Z^1 is hydrogen, and hydrogen when Z^1 is



A, when Z^1 is



is a member selected from the group consisting of cyano and ethynyl, and when Z^1 is hydrogen, is a member selected from the group consisting of hydrogen, cyano and ethynyl; and X and Y which may be the same or different are each a member selected from the group consisting of chlorine and bromine, and (ii) an inert carrier therefor.

4,409,239

PROPYLENE GLYCOL DIESTER SOLUTIONS OF PGE-TYPE COMPOUNDS

Cheng-Der Yu, Mountain View, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 21, 1982, Ser. No. 341,403
Int. Cl.³ A61K *31/215, 31/19*
U.S. Cl. 424—305 **33 Claims**

1. A stable pharmaceutical composition of a PGE or PGE-type compound comprising a solution of said compound in a solvent comprising at least propylene glycol diester of short chain fatty acid.

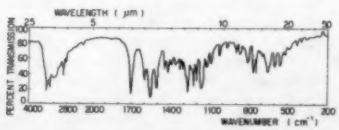
14. A method for preparing a stable soft-shell gelatin composition of PGE or PGE-type compounds which comprises dissolving at least one of said compounds in a solvent comprising at least one propylene glycol diester of a short chain fatty acid and adding the mixture to a soft-shelled gelatin capsule.

4,409,240

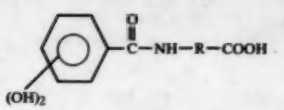
DERIVATIVES OF DIHYDROXYBENZOIC ACID AND PHARMACEUTICAL COMPOSITION THEREOF

Hitoshi Takita; Yutaka Mukaida; Sakuo Noda, and Hidetoshi Kobayashi, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,372
Claims priority, application Japan, Feb. 24, 1981, 56-25991
Int. Cl.³ A61K *31/195;* **C07C** *101/30*
U.S. Cl. 424—319 **5 Claims**

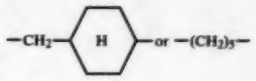


1. A derivative of dihydroxybenzoic acid represented by the formula (I):



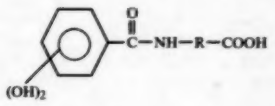
(I)

wherein R represents



or a salt or an ester thereof.

5. A pharmaceutical composition in dosage unit form comprising a therapeutically effective amount of a derivative of dihydroxybenzoic acid represented by the formula (I):



(I)

wherein R is as defined in claim **1**, or a salt or an ester thereof, and a pharmaceutically acceptable carrier.

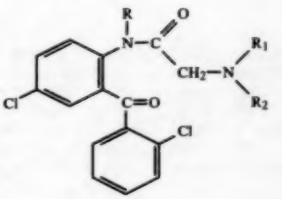
4,409,241

METHOD OF TREATING ANXIETY WITH 2'-(ORTHOCHLOROBENZOYL)-4'-CHLORO-GLYCYLANILIDES, AND COMPOSITIONS THEREOF

Gilbert Mouzin; Henri Cousse, and Antoine Stenger, all of Castres, France, assignors to Pierre Fabre S.A., Paris, France

Division of Ser. No. 312,529, Oct. 19, 1981, Pat. No. 4,370,347, which is a division of Ser. No. 76,841, Sep. 19, 1979. This application Sep. 20, 1982, Ser. No. 419,974
Claims priority, application France, Sep. 25, 1978, 78 27401
Int. Cl.³ A61K *31/16, 31/205*
U.S. Cl. 424—324 **18 Claims**

1. A pharmaceutical composition, suitable for use in the treatment of anxious states, comprising a 2'-(ortho-chlorobenzoyl)-4'-chloroglycylanilide selected from compounds having the formula I:



(I)

in which:

R represents hydrogen or lower-alkyl;

R_1 and R_2 may be identical or different and are selected from hydrogen, lower-alkyl, lower-alkenyl, and lower-alkynyl, and cycloalkyl having three to six ring members, inclusive, with the proviso that, when one of R_1 and R_2 represents hydrogen the other is not lower alkyl; and with the further proviso that R_1 and R_2 cannot simultaneously represent either hydrogen or lower-alkyl,

and a pharmaceutically acceptable inorganic or organic acid addition salt thereof, in an amount effective for said purpose, in association with a pharmaceutical carrier.

4,409,242

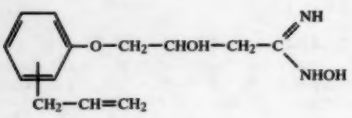
4-PHENOXY-3-HYDROXY-BUTYRAMIDOXIME DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons-Alfort, France

Filed Mar. 19, 1982, Ser. No. 360,057
Claims priority, application France, Mar. 31, 1981, 81 06469
Int. Cl.³ A61K *31/155;* C07C *131/00*
U.S. Cl. 424—326 3 Claims

1. A new 4-phenoxy-3-hydroxybutyramidoxime derivative selected from the group consisting of:

(i) 4-(allylphenoxy)-3-hydroxy-butyramidoximes of the general formula:



(I)

and,

(ii) addition salts thereof.

3. A therapeutical composition comprising, in association with a physiologically acceptable excipient, a pharmaceutically effective amount of a compound according to claim 1 as antiarrythmic agent.

4,409,243

TREATMENT OF AUTO-IMMUNE AND INFLAMMATORY DISEASES

Julian Lieb, 41 Village La., Bethany, Conn. 06525

Filed Nov. 9, 1981, Ser. No. 319,651
Int. Cl.³ A61K *31/15, 31/42, 31/44, 31/135*
U.S. Cl. 424—330 1 Claim

1. A method for the treatment of arthritis in a subject, which method comprises administering to the subject an effective amount therefor of a monoamine oxidase inhibiting drug selected from the group consisting of mebanazine, and tranylcypromine.

4,409,244

CHEWING GUM CONTAINING FRUCTOSE SYRUP

Subraman R. Cherukuri; Dominick R. Friello, both of Danbury; Walter Hopkins, Greenwich, all of Conn.; Ellery Parker, Johnstown, and Donald A. M. Mackay, Pleasantville, both of N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 217,625, Dec. 18, 1980, abandoned. This application Aug. 13, 1982, Ser. No. 407,686
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 5 Claims

1. A chewing gum having good shelf-life, is easy to remove from its wrapper and is free of corn syrup, said chewing gum consisting essentially of particles of gum base, a first portion of sugar dispersed and trapped in said particles of gum base, a second portion of sugar mixed with said particles of gum base containing said first portion of sugar, and pure fructose syrup which contains from about 25 to about 90% by weight fructose solids, the total amount of sugar being within the range of from about 30 to about 80% by weight of said chewing gum, and from about 8 to about 30% by weight of said chewing gum being pure fructose syrup which serves as a humectant admixed with said particles of sugar containing gum base.

4,409,245

PROTECTION OF MICROORGANISMS AGAINST BACTERIOPHAGE VIRUS ATTACKS

Erich Wolf, Overath; Andreas Lembke, Eutin-Sielbeck, and Rolf Deininger, Cologne, all of Fed. Rep. of Germany, assignors to Chimicasa GmbH, Chur, Switzerland

Continuation-in-part of Ser. No. 5,761, Jan. 23, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,409
Claims priority, application Luxembourg, Jan. 27, 1978, 78955; Jan. 2, 1979, 80748
Int. Cl.³ A23C *9/12, 9/123, 9/13;* C12N *1/04*
U.S. Cl. 426—9 4 Claims

1. A method for protecting a living culture of microorganisms selected from the group consisting of streptococcus lactis, streptococcus cremeris and streptococcus diacetylicatis from attack by phage viruses comprising adding to the microorganism culture a terpene capable of demonstrating a viricidal activity against phage viruses in an amount effective to obtain such viricidal activity but ineffective to cause toxic effect in the microorganisms, wherein said terpene is selected from the group consisting of black pepper oil, cinnamon flower oil, cardamom oil, linallyl acetate, cinnamic adehyde, safrol, carvon, cis/trans citral and combinations thereof.

4,409,246

YEAST STRAIN FOR FERMENTING HIGH PLATO VALUE WORTS

Graham G. Stewart; Thomas E. Goring, and Ingeborg Russell, all of London, Canada, assignors to Labatt Brewing Company Limited, London, Canada

Filed Jul. 22, 1981, Ser. No. 285,854
Int. Cl.³ C12C *11/04;* C12N *1/18*
U.S. Cl. 426—16 9 Claims

1. In a brewing process wherein a malt wort is prepared; fermented with brewers' yeast; and, following completion of the fermentation, finished to the desired alcoholic brewery beverage; the improvement comprising fermenting said wort having a Plato value of about 14.5 or greater with a strain of the species *Saccharomyces cerevisiae* brewers' yeast having the NCYC No. 962.

7. A biologically pure culture of a brewer's yeast strain of the species *Saccharomyces cerevisiae* having the NCYC No. 962, said strain having the ability to ferment high Plato value worts of 14.5 or greater and the ability of flocculate to the bottom of the fermentation vessel when attenuation is substantially complete.

4,409,247

PROCESS FOR HYDROLYZING LACTOSE WITH IMMOBILIZED LACTOSE

Jean-Luc A. G. Baret, Moret, and Luc A. Dohan, Fontainebleau, both of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 3, 1981, Ser. No. 269,945
Claims priority, application France, Jun. 6, 1980, 80 12616
Int. Cl.³ A23C *21/02;* C12N *11/14*
U.S. Cl. 426—41 14 Claims

1. A process for treating whey whereby at least a portion of the lactose contained therein is hydrolyzed into glucose and galactose by means of an immobilized lactase, which process comprises the steps of:

A. heating the whey to a temperature of from about 45° to about 90° C. for at least about 15 seconds;

B. centrifuging the heated whey while it is still warm;

C. contacting the centrifuged whey with an immobilized lactase under conditions sufficient to hydrolyze at least a portion of the lactose contained therein into glucose and galatose;

D. cleaning the immobilized lactase by contacting the immobilized lactase with a solution of a protease which removes protein coating the immobilized lactase without significant

deleterious effects on the enzymatic activity of the immobilized lactase; and

E. disinfecting the immobilized lactase by contacting the immobilized lactase with a disinfecting solution which substantially kills the contaminating microorganisms without significant deleterious effects on the immobilized lactase; wherein the lactase is immobilized on an inorganic support.

4,409,248

HEAT-GELLING AND FOAM-STABILIZING ENZYMATICALLY MODIFIED VEGETABLE ISOLATES

William F. Lehnhardt, and Frank T. Orthoefer, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 10, 1981, Ser. No. 291,671
Int. Cl.³ A23J *3/00, 3/00;* C12P *21/06*
U.S. Cl. 426—46 **42 Claims**

12. A method for providing a heat-gelling, enzymatically modified vegetable glycoprotein composition containing (on a weight basis) 7S glycoprotein as the major protein component of said composition, said method comprising enzymatically treating an aqueous vegetable solution which on a total protein weight basis contains 7S glycoprotein as the major vegetable protein component with proteinase to partially hydrolyze the glycoprotein into glycoprotein aggregates of an average molecular weight within the 200,000 to 300,000 molecular weight range in which the glycoprotein aggregates consisting essentially of a plurality of enzymatically modified glycoprotein subunits of an average molecular weight less than that of the unhydrolyzed glycoprotein subunit precursor source material for said enzymatically modified protein composition and, the enzymatically modified glycoprotein subunits are characterized as having an average electrophoretic migration value less than that of the unhydrolyzed subunits precursor source material for said composition, and said composition is being further characterized as forming a solid, opaque gel when an aqueous solution adjusted to 0.1 M sodium chloride concentration and pH 5.75 and containing 15 protein grams of said composition for each 100 ml of water is heated at 85° C. for 15 minutes.

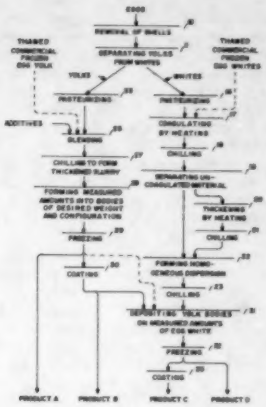
4,409,249

EGG PRODUCT AND PROCESS OF MANUFACTURE

John H. Forkner, 2116 Mayfair Dr. West, Fresno, Calif. 93703

Continuation of Ser. No. 183,252, Sep. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,684, Jul. 23, 1979, abandoned, and a continuation-in-part of Ser. No. 83,116, Oct. 9, 1979, abandoned. This application Mar. 12, 1982, Ser. No. 357,821
Int. Cl.³ A23B *5/04;* A23L *1/32*
U.S. Cl. 426—100 **45 Claims**

1. A process for producing an egg product from raw egg white separated from egg yolk comprising the steps of heating the egg white to effect preliminary coagulation thereof, subjecting a portion of the coagulated egg white to processing together with an uncoagulated egg white portion, the processing including applying high energy agitation to said coagulated



and uncoagulated portions to form a homogeneous aerated dispersion, and then freezing the dispersion.

4,409,250

METHOD FOR PREPARING SUGAR COATED, PUFFED SNACKS UPON MICROWAVE HEATING

Glenn J. Van Hulle, Brooklyn Park; Charles A. Anker, and Dean E. Franssell, both of Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed May 29, 1979, Ser. No. 43,572
Int. Cl.³ A21D *2/18, 2/36, 8/02, 8/06*
U.S. Cl. 426—242 **4 Claims**

1. A process for preparing a sugary coated snack product by microwave heating, comprising the steps of:

A. forming a gelatinized starch-containing dough having a moisture content of about 12% to 25% by weight;

B. shaping the dough into a plurality of discrete pieces;

C. partially drying said pieces at a temperature of about 70° F. to 200° F. and at a relative humidity of at least 35% for a period of time sufficient to reduce the moisture content of the pieces to between about 5% to 15%;

D. dispersing the partially dried pieces throughout a puffing medium consisting essentially of, from about 40% to 95% by weight of the puffing medium, a nutritive carbohydrate sweetening agent and from about 5% to 10% by weight moisture, wherein the puffing medium is substantially free of protein sources and wherein the weight ratio of puffing medium to the pieces is about 0.1:1 to 4:1, to form a puffing medium/piece matrix; thereafter

E. microwave heating the matrix for about 1–4 minutes to form a plurality of puffed pieces enrobed in a sugar coating; and,

F. cooling to room temperature to harden the sugar coating on the puffed pieces.

4,409,251

CONTROLLABLY MOISTURIZED MOLD RESISTANT CELLULOSIC FOOD CASINGS

Thomas E. Higgins, Riverside, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 25, 1982, Ser. No. 361,878
Int. Cl.³ B65B *55/00;* A23L *1/31;* F16L *11/00*
U.S. Cl. 426—413 **10 Claims**

1. In an improved large size tubular cellulosic food casing controllably premoisturized to an extent that it can be stuffed without the addition of further moisture prior to stuffing, and

having a moisture content of between about 17 and about 30 weight percent, based on the total weight of said casing, the improvement comprising the glycerine content in the casing being at least about 40 weight percent based on the total weight of dry cellulose in said casing, with the proviso that said glycerine content is sufficient to maintain the water activity in the casing at not greater than 0.80.

9. In a process for preparing an encased food product having a stuffed diameter of not less than about 50 millimeters, wherein a large sized tubular cellulosic food casing having fibrous web embedded in its wall is provided, having a preadjusted moisture content of between about 17 and about 30 weight percent moisture based on the total weight of casing to impart to said casing sufficient extensibility and flexibility for the casing to be stuffed with a foodstuff without the addition of further moisture, and wherein said casing is stuffed with said foodstuff to form said encased food product,

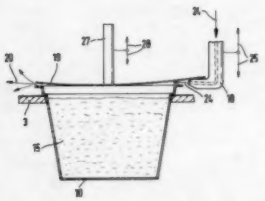
the improvement comprising incorporating into said casing a sufficient amount of glycerine such that the casing glycerine content is at least about 40 weight percent based on the weight of dry cellulose in the casing, with the proviso that said glycerine content is sufficient to maintain the water activity in the casing at no greater than 0.80, and stuffing said casing to form said encased food product without adding further moisture to said casing prior to said stuffing.

4,409,252

PROCEDURE FOR PACKAGING OF FOOD UNDER PROTECTIVE GAS IN SYNTHETIC CONTAINERS WITH FLEXIBLE TOPS

Guido Buschkens, Krefeld, and Peter Nobis, Neuss, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,329
Int. Cl.³ B65B *31/04, 31/06*
U.S. Cl. 426—396 **6 Claims**



1. In a procedure for packaging of food under protective gas in synthetic material containers with flexible lids sealed to the rims of the containers where the packaging steps include product filling, protective gas flushing, lid application, and lid sealing; the improvement being in that the packaging steps are performed in the sequence of product filling and then lid application and then flushing with protective gas and then sealing of the lids, the packaging steps being performed to the container while the container is mounted to a movable conveyor, the lid, relative to the movement of the conveyor having upstream and downstream portions and side portions intermediate thereof, the lid application step comprising placing the lid on the container rim so that the lid lies flat on the container, securing the flat-oriented lid to the container at selected spots on the rim thereof intermediate the upstream and downstream portions of the lid, the upstream portion of the lid having a tear-off tongue projecting beyond the container rim, the protective flushing gas step comprising placing a protective flushing gas nozzle beneath the tear-off tongue, raising the nozzle to lift the tear-off and create flow communication between the nozzle and the container head space while the container is stationary, blowing the protective flushing gas through the nozzle and into the head space, utilizing the escaping air from the head space to raise the lid at an unsecured location remote from the tear-off tongue, lowering the nozzle and moving the nozzle sideways out of the path of movement of the container to permit the lid to return to its flat condition, and moving the container to the lid sealing station.

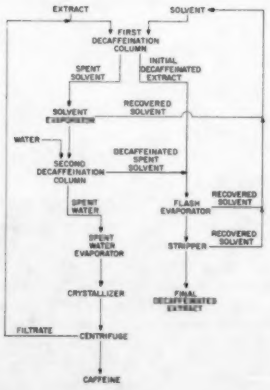
4. In a procedure for packaging a food under protective gas in synthetic material containers with flexible lids sealed to the rims of the containers where the packaging steps include product filling, protective gas flushing, lid application, and lid sealing; the improvement being in that the packaging steps are performed in the sequence of product filling and then lid application and then flushing with protective gas and then sealing of the lids, the packaging steps being performed to the container while the container is mounted to a movable conveyor, the lid, relative to the movement of the conveyor, having upstream and downstream ends and side portions intermediate thereof, the lid having a tear-off tongue located at one of the side portions and projecting beyond the rim of the container, the lid application step comprising placing the lid on the container rim so that the lid lies flat on the container, securing the flat-oriented lid to the container at one of the ends of the lid, the protective gas flushing step comprising positioning a fixed wedge in the path of motion of the container located to have the narrow end of the wedge slide beneath the tear-off tongue of the lid, raising the tear-off tongue away from the container as the tear-off tongue slides upwardly along the wedge to expose the head space of the container to the thick end of the wedge, the thick end of the wedge having a bore in flow communication with a protective flushing gas nozzle, blowing the protective gas from the nozzle and through the bore into the head space of the container, utilizing the escaping air from the head space to raise the lid at an unsecured location remote from the tear-off tongue, and permitting the lid to return to its flat condition as the container moves away from the wedge and to the lid sealing station.

4,409,253

RECOVERY OF NONCAFFEINE SOLUBLES IN AN EXTRACT DECAFFEINATION PROCESS

Lowen R. Morrison, Jr., Hamilton, Ohio; Melisse N. Elder, Villa Hills, Ky., and John H. Phillips, Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 240,730, Mar. 5, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,752
Int. Cl.³ A23F *5/22*
U.S. Cl. 426—424 **22 Claims**



1. A decaffeination process which recovers 90% or more of the caffeine from a coffee extract, which comprises the steps of:

(a) contacting roast coffee extract with ethyl acetate solvent to form decaffeinated extract and a caffeine-containing solvent phase;
(b) contacting the caffeine-containing solvent phase with water to form an aqueous caffeine-containing phase and a decaffeinated solvent phase;
(c) crystallizing caffeine in the aqueous phase by cooling the aqueous phase, concentrating the aqueous phase, or a combination thereof;
(d) separating the crystallized caffeine from the residual aqueous phase; and
(e) recovering noncaffeine solubles from the residual aqueous phase in an amount of about 80% or more based on the non-caffeine solubles present in the aqueous caffeine-containing phase of step (b), by adding the residual aqueous phase to the coffee extract of step (a).

4,409,254

PROCESS FOR CONCENTRATING AND ISOLATING A BEET COLORANT

Torunn A. Garin, Bronxville, and Gerald J. Vogel, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,568
Int. Cl.³ A23L *1/27, 1/277*
U.S. Cl. 426—540 **11 Claims**

1. A process for the concentration and isolation of betanin pigment from an aqueous extract of a plant containing betanin comprising the steps of lowering the pH of said aqueous extract to 1.5 to about 2.7, contacting the pH-adjusted extract with a nonionic adsorbent so that the betanin pigment concentrates on the adsorbent, eluting the adsorbent to remove the betanin pigment from the adsorbent to an eluting agent, and separating the pigment from the eluting agent.

4,409,255

COLD WATER SOLUBLE GELATIN AND PROCESS

Robert L. Danielson, and Peter M. Bosco, both of Brookfield Center, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 22, 1982, Ser. No. 350,559
Int. Cl.³ A23L *1/04*; A23J *1/10, 3/00*
U.S. Cl. 426—576 **21 Claims**

1. A process for preparing a cold water soluble gelatin product, comprising: preparing an aqueous solution comprising gelatin, sugar containing corn syrup solids and maltodextrin, the ratio of sugar to gelatin being in the range of from about 3:1 to about 7:1, acid and an amount of surface-active agent effective to increase dispersibility in the final product, and drying the solution.

4,409,256

SOYMILK PROCESS

Lawrence A. Johnson, College Station, Tex.; William J. Hoover, and Charles W. Deyoe, both of Manhattan, Kans., assignors to The Edlong Corporation, Elk Grove Village, Ill.

Filed Mar. 13, 1981, Ser. No. 249,717
Int. Cl.³ A23L *1/20, 2/38*
U.S. Cl. 426—598 **6 Claims**

3. A process for the manufacture of a soybean product from whole soybeans, said product consisting essentially of at least 70% or more of the whole soybean solids in a stable dispersion and containing trypsin inhibitor activity less than 10 percent than that found in whole soybeans with reference to total solids in said product, said process comprising:
(a) dry comminuting whole soybeans at room temperature;
(b) adding water to the dry comminuted soybeans to form an aqueous slurry containing substantially 10 to 25 percent by weight of said comminuted soybeans at room temperature;
(c) quickly subjecting said slurry, shortly after formation, to steam infusion to minimize oxidation of the slurry, providing extreme turbulence and high shear to heat said slurry from room temperature to within a range of substantially 270° F. (121° C.) to 310° F. (154° C.) at a rate of at least substantially 30° F. (11.4° C. per second while confining said slurry within a vessel and holding said heated slurry for a time within a range of substantially 15–270 seconds, the time and temperature being inversely related;
(d) rapidly cooling said slurry after heating to below the browning temperature of the slurry; and without further grinding constituting a soybean product in a stable dispersion.

4,409,257

HOMOGENEOUS, FREE-FLOWING LIQUID BLACK PEPPER OLEORESIN COMPOSITION

G. Duane Deline, Glen Arm, Md., assignor to McCormick & Company, Inc., Hunt Valley, Md.

Filed May 25, 1982, Ser. No. 381,756
Int. Cl.³ A23L *1/221*
U.S. Cl. 426—651 **8 Claims**

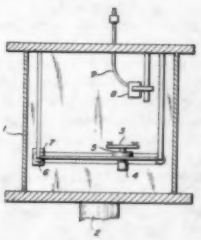
1. A homogeneous, free-flowing, liquid oleoresin composition consisting essentially of 20 to 60 weight percent black pepper oleoresin, 20 to 50 weight percent benzyl alcohol and 0 to 50 weight percent food grade emulsifiers and/or diluents.

4,409,258

TREATMENT PROCESS FOR RENDERING CORNEAL CONTACT LENSES HYDROPHILIC

Bernard Feurer, Saint Orens de Gameville, and Philippe Baronet, Toulouse, both of France, assignors to Alcon Pharmaceuticals Limited, Cham, Switzerland

Filed May 5, 1981, Ser. No. 260,674
Claims priority, application France, May 29, 1980, 80 12169
Int. Cl.³ G02B *1/12, 1/04*
U.S. Cl. 427—38 **9 Claims**



1. A process for treating contact lenses made of polymers or mixtures of polymers, said process rendering said lenses hydrophilic or increasing their hydropilic nature at their surface and to a given depth, said process comprising: producing an electric field between a cathode and an anode; subjecting a gas from the group consisting of nitrogen, oxygen, and compounds thereof to the electric field, the gas being supplied between the anode and the cathode at a pressure between 10^{-4} and 10^{-3} millibars; causing at least a part of the positive ions accelerated by the cathode to traverse the cathode in a narrow beam thereby generating a narrow beam of positive ions identical in nature and having substantially the same kinetic energy; bombarding each lens at a position removed from between the cathode and the anode with the positive ion beam by having the positive ion beam sweep over the lens so as to expose the surface of the lens uniformly to the beam whereby each point of the surface receives substantially the same amount of ions at the same incident energy thereby achieving homogeneous treatment of the lens surface and to a given depth within the lens; and, thereafter hydrating each contact lens.

4,409,259

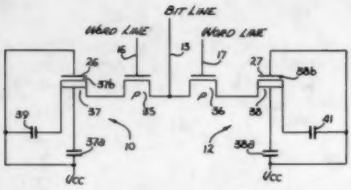
MOS DYNAMIC RAM CELL AND METHOD OF FABRICATION

Mark T. Bohr, Beaverton; Kenneth K. Yu, Portland; Ronald J. C. Chwang, Beaverton, and C. Neil Berglund, Lake Oswego, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 182,870, Sep. 2, 1980, Pat. No. 4,364,075. This application Jul. 29, 1982, Ser. No. 403,116

Int. Cl.³ H01L *29/78, 27/02;* **B05D** *5/12*

U.S. Cl. 427—38 **4 Claims**



1. A process for forming a pair of storage capacitors in an n-type well for use in dynamic memory cells, comprising the steps of:

forming a p-type region in said well;

forming a polysilicon layer over said p-type region, said layer being doped with an n-type dopant and contacting said p-type region at a predetermined area;

driving said n-type dopant from said polysilicon layer at said predetermined area through said p-type region so as to separate said p-type region into a first and a second p-type region separated by an n-type region;

whereby two storage capacitors are formed.

4,409,260

PROCESS FOR LOW-TEMPERATURE SURFACE LAYER OXIDATION OF A SEMICONDUCTOR SUBSTRATE

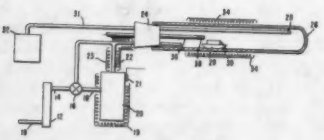
Ricardo C. Pastor, Manhattan Beach; Remedios K. Chew, Long Beach, and Luisa E. Gorre, Oxnard, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 230,243, Feb. 21, 1981, abandoned, which is a continuation of Ser. No. 66,606, Aug. 15, 1979, Pat. No. 4,267,205. This application Jun. 28, 1982, Ser. No. 392,499

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.³ H01L *21/316*

U.S. Cl. 427—82 **8 Claims**



1. A process for forming a coherent, uniform oxide layer on the surface of a selected semiconductor material which comprises:

(a) providing a wafer of said semiconductor material; and

(b) heating said wafer to a temperature of about 750° C. or lower in the presence of a selected oxygen-containing precursor and a chosen gas phase halogen-containing molecular reactant capable of reacting with said oxygen-containing precursor at said temperature to form atomic oxygen, for a period of time sufficient to enable said atomic oxygen to react with the surface atoms of said wafer and thereby form said coherent, uniform oxide layer, said temperature being sufficiently low to avoid adverse effects on said wafer.

4,409,261

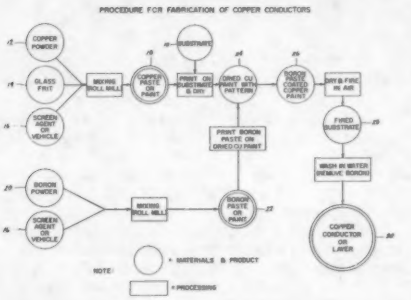
PROCESS FOR AIR FIRING OXIDIZABLE CONDUCTORS

Charles Y. Kuo, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 119,202, Feb. 7, 1980. This application Nov. 18, 1981, Ser. No. 322,413

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—96 **15 Claims**



1. A method of forming a thick film electrical conductor on a non-conductive substrate wherein the resistance is less than one ohm per square, comprising the steps of intimately mixing a copper powder, glass frit and vehicle to form a printable mixture, printing the mixture on a non-conductive substrate and thereafter drying the mixture, preparing a combination of boron powder and vehicle which are intimately mixed together and applying the boron powder-vehicle mixture over the entire surface of the previously printed and dried mixture, drying the boron powder-vehicle mixture, firing the boron on top of the printed copper powder and glass frit mixture, and finally washing with water to remove the boron and boron oxide from the surface of the substrate and overlying printed surface.

4,409,262

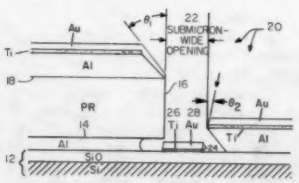
FABRICATION OF SUBMICRON-WIDE LINES WITH SHADOW DEPOSITIONS

Edward C. Jelks, Dallas, Tex., and George L. Kerber, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 1, 1982, Ser. No. 344,341

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—99 **1 Claim**



SHADOW DEPOSITION GEOMETRY.

1. A method of fabricating elongate conductive lines of submicron width on a silicon oxide-on-silicon substrate carried on a copper heatsink comprising the steps of:

depositing a first layer of aluminum to a thickness of 1000 A upon the substrate;

spinning a photoresist layer on the aluminum layer to provide an evenly distributed photoresist layer in a prearranged pattern;

etching the aluminum layer with a mixture of two parts phosphoric acid, one part acetic acid and one part deionized water to undercut the photoresist edge;

depositing a second layer of aluminum at an angle θ_1 to an edge of the photoresist layer, thereby defining an elongate submicron-wide opening to the underlying substrate;

depositing a titanium layer on the substrate and a gold layer on the titanium layer for the elongate conductive lines onto the substrate at an angle of θ_2 through the elongate submicron-wide opening; and

removing undesired material surrounding the elongate conductive lines by dissolving the photoresist layer in hot acetone followed by stripping the remaining portions of said first layer of aluminum and said second layer of aluminum with etchant.

4,409,263

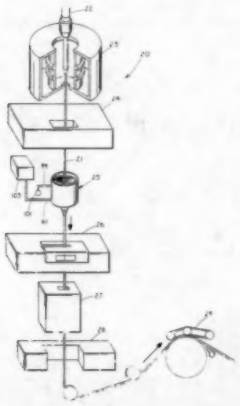
METHODS OF AND APPARATUS FOR COATING LIGHTGUIDE FIBER

Charles J. Aloisio, Jr.; Terrence A. Lenahan, both of Chamblee; James V. Smith, Jr., Decatur, and Carl R. Taylor, Lawrenceville, all of Ga., assignors to Western Electric Co., Inc., New York, N.Y. and Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Jan. 27, 1982, Ser. No. 343,134

Int. Cl.³ G02B *5/14, 1/10;* **B05C** *3/12*

U.S. Cl. 427—163 **27 Claims**



1. A method of coating an elongated material to provide a substantially bubble-free covering, said method including the steps of:

advancing the elongated material through a continuum of liquid coating material, which extends from a free surface in a reservoir through first and second dies at opposite ends of a chamber, at a velocity which causes air to become entrained in the coating material, the advancing of the elongated material being in a direction from the reservoir to the second die and causing a pressure gradient to be established between portions of the first die and between the chamber and the second die with the pressure decreasing from an exit orifice of the first die to the free surface and increasing from within the chamber to a location prior to the exit orifice of the second die; and

flowing coating material into the chamber at a pressure which sufficiently enhances the pressure gradient between the portions of the first die and which establishes sufficient volumetric flow of the coating material from the chamber into the reservoir to cause the removal of bubbles from the elongated material and to cause the coating material in the chamber and on the coated elongated material to be substantially bubble-free.

4,409,264

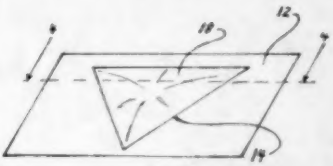
BOSS FORMATION USING LOW SURFACE ENERGY DAMS

Kenneth B. Gilleo, and Willard H. Kreibich, both of Sparta, Wis., assignors to Northern Engraving Corporation, Sparta, Wis.

Filed Apr. 1, 1981, Ser. No. 250,070

Int. Cl.³ B05D *1/36, 5/00, 3/06*

U.S. Cl. 427—265 **22 Claims**



1. A method for forming an elevated boss on an article surface having a surface energy greater than 30 dynes per centimeter including the steps of

(a) forming on the article surface a continuous, raised retaining means defining a boundary enclosing a pattern area, at least a portion of the retaining means being formed by applying a continuous strip of a liquid boundary-forming composition containing a low surface energy compound having a surface energy of about 5 to about 20 dynes per centimeter;

(b) introducing a liquid resin into the pattern area in a quantity sufficient to completely cover the pattern area at a depth greater than the height of the retaining means without flowing over the retaining means, the liquid resin being solidifiable at a temperature below the deformation temperature of the article surface and below the decomposition temperature of the boundary-forming composition and having reaction and solubility rates with the article surface and the boundary-forming composition which are sufficiently low to prevent significant weakening or destruction of the article surface or the retaining means prior to and during solidification of the liquid resin; and

(c) solidifying the liquid resin while maintaining the pattern area in an essentially horizontal plane.

4,409,265

METHOD AND APPARATUS FOR THE ONE-SIDED COATING OF CONTINUOUS METAL STRIP

Klaus Frommann, Dusseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,177

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1981, 3101760

Int. Cl.³ B05D *3/12, 1/18, 1/28;* **B05C** *1/00*

U.S. Cl. 427—271 **10 Claims**

1. A method for the one-sided coating of a continuous metal strip, comprising the steps of:

(a) maintaining a vessel of liquid coating material;

(b) directing a metal strip about a horizontally rotating guide roller located above said vessel of liquid coating material;

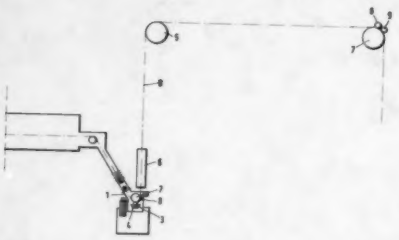
(c) rotating a feed roller, parallel to said guide roller, and

displaced into said vessel by at least half of its circumference;

(d) transferring liquid coating material from said feed roller to one side of said metal strip by rotating said feed roller in the same direction of rotation as said guide roller;

(e) performing said steps (a)–(d) in an inert atmosphere at an elevated temperature;

(f) the temperature of said inert atmosphere being such that said continuous metal strip leaves said inert atmosphere at a temperature of about 400° C.;



(g) controlling the desired coating thickness by use of a metering device; wherein the improvement is characterized by the steps of

(h) cooling said metal strip to a temperature of about 100° C. by causing it to travel a distance from said inert atmosphere; and then

(i) mechanically removing on oxide layer from the uncoated side of said metal strip.

4,409,266

PROCESS FOR THE SHATTERPROOF COATING OF GLASS SURFACES

Wolfhart Wieczorrek, Cologne, and Gerhard Mennicken, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,370

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119151

Int. Cl.³ B05D *3/04, 3/10*

U.S. Cl. 427—302 **13 Claims**

1. A process for coating glass surfaces to render them shatterproof which comprises

(a) applying a physically drying priming lacquer which comprises

(i) a silane adhesion promoter,

(ii) a polyurethane polyurea binder which has a linear molecular structure and which is soluble in lacquer solvents,

(iii) at least one catalyst which accelerates the isocyanate-addition reaction, and

(iv) at least one solvent,

(b) drying the priming lacquer,

(c) coating the dried priming lacquer with a solvent-free or substantially solvent-free coating composition containing a two-component polyurethane binder comprising an isocyanate-reactive component and an isocyanate-containing component, and

(d) reacting the two-component polyurethane binder to harden the coating composition.

4,409,267

METHOD FOR THE FINISHING TREATMENT OF FABRIC MATERIALS

Shoji Ichinohe, and Katsusuke Kasahara, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

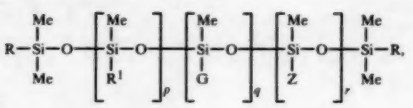
Filed Apr. 8, 1982, Ser. No. 366,761

Claims priority, application Japan, Apr. 15, 1981, 56-56580

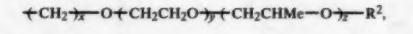
Int. Cl.³ B05D *3/02*

U.S. Cl. 427—387 **1 Claim**

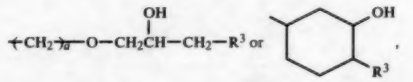
1. A method for the finishing treatment of a fabric material which comprises soaking the fabric material with a liquid composition comprising, as the effective ingredient thereof, an organopolysiloxane represented by the general formula



in which Me is a methyl group, R^1 is a hydrogen atom or a monovalent hydrocarbon group having from 1 to 14 carbon atoms, G is a polyoxyalkylene group represented by the general formula



R^2 being a hydrogen atom or a monovalent hydrocarbon group having from 1 to 20 carbon atoms, x being a number of 0, 1, 2 or 3 and y and z each being zero or a positive integer not exceeding 200 with the proviso that y+z cannot be equal to zero, Z is an amino-containing group represented by the general formula



a being zero or 3 and R^3 being a substituted or unsubstituted amino group, R is a group selected from R^1, G and Z, and p, q and r are each a positive integer not exceeding 800, and drying the fabric material wet with the liquid composition.

4,409,268

LIQUID CRYSTAL DISPLAY PANELS AND PROCESS FOR THEIR PRODUCTION

Hiroshi Inoue, and Nobuo Tooyama, both of Ena, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

PCT No. PCT/JP80/00045, § 371 Date Nov. 5, 1980, § 102(e) Date Nov. 5, 1980, PCT Pub. No. WO80/02079, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 17, 1980, Ser. No. 212,731

Claims priority, application Japan, Jul. 13, 1979, 54-89665; Jul. 19, 1979, 54-32000; Oct. 12, 1979, 54-131985; Oct. 26, 1979, 54-139052

Int. Cl.³ G09K *3/34*

U.S. Cl. 428—1 **17 Claims**

1. In a liquid crystal display panel in which a plastic film provided with a transparent conductive film is used as a panel substrate, the improvement of a liquid crystal display panel which is characterized by an orientation treated film on said substrate which is formed from a reaction product of a saturated polyester and a reinforcing additive which is one or more components selected from the group consisting of a reactive titanium compound, an isocyanate compound, an acid anhydride and a melamine resin.

4,409,269

FRAMED WOOD BLOCK FACING

Harlis Gardner, Rte. 2, Box 401, Raymond, Wash. 98577

Filed Mar. 12, 1982, Ser. No. 357,384
Int. Cl.³ B32B 3/14, 3/02
U.S. Cl. 428—50 2 Claims

1. A decorative facing comprising: a backing; several individual rectangular wood blocks of substantially uniform thickness and width and secured to said backing in several substantially straight, parallel, uniformly spaced rows with their lengths extending lengthwise of said rows, each of said rows having a plurality of said blocks with the adjacent ends of adjacent blocks spaced apart uniformly lengthwise of such row so that the distance between the adjacent ends of adjacent blocks is substantially equal to the distance between adjacent blocks in adjacent rows transversely of such rows; first elongated wood strips interposed between adjacent rows of blocks, having faces adjacent to and secured to the backing, of a width substantially equal to the distance between adjacent rows of blocks and of a length at least as great as the combined lengths of a plurality of the blocks in at least one of such adjacent rows so as to extend unbrokenly in a direction lengthwise of and alongside a plurality of the blocks in such one adjacent row; and second elongated wood strips interposed between the adjacent ends of adjacent blocks in one of the rows, having faces adjacent to and secured to the backing, of a width substantially equal to the distance between such adjacent block ends and extending transversely of such row between adjacent first strips bordering such row; said first and second strips framing said blocks and maintaining alignment of said blocks, and the faces of said strips and said blocks remote from said backing being exposed to view.

4,409,270

METHOD FOR REPAIRING GLASS FIBER REINFORCED PLASTIC PARTS AND PRODUCT

Dolan D. Faber, Akron; Richard G. Holmes, Wadsworth, and Joseph J. Varano, Hartville, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Apr. 22, 1982, Ser. No. 370,873
Int. Cl.³ B32B 3/26
U.S. Cl. 428—63 16 Claims

1. A method for repairing a surface defect in a thermoset fiberglass reinforced polyester resin or vinyl ester resin molding comprising

(I) filling said defect with an excess amount of a thermosetting electrically conductive repair material,

(II) applying to said repair material heat at a temperature of from about 280° F. to 415° F. and pressure at from about 25 to 50 psi, or from about 36 to 50 psi, for a period of time sufficient to cure said repair material without substantial shrinkage,

(III) withdrawing the heat and pressure from the part and allowing the part to cool to room temperature and

(IV) finishing said part in the area of said defect to remove excess repair material and to return the part to its original contour, said repair material consisting essentially of

(a) a polymerizable epoxy based oligomer having at least two acrylate groups in an amount of 100 parts by weight,

(b) a copolymerizable ethylenically unsaturated monomer in an amount of from about 80 to 150 parts by weight,

(c) a zinc salt of a fatty acid having at least 10 carbon atoms in an amount of from about 0.2 to 5 parts by weight,

(d) an accelerator for an organic free radical peroxide initiator in an amount of from about 0.05 to 2 parts by weight,

(e) polyvinyl acetate in an amount of from about 30 to 80 parts by weight,

(f) a copolymerizable monoethylenically unsaturated compound having a —CO— group and a —NH_2, —NH— and/or —OH group in an amount of from about 20 to 120 parts by weight,

(g) a copolymerizable liquid acrylate compound having from 2 to 4 vinyl groups, being free of urethane, cycloaliphatic and aromatic groups and having an average molecular weight of up to about 1500 in an amount of from about 20 to 120 parts by weight,

(h) a calcium salt of a fatty acid having at least 10 carbon atoms in an amount of from about 0.2 to 5 parts by weight,

(i) an inorganic filler in an amount of from about 50 to 150 parts by weight,

(j) a conductive carbon black in an amount of from about 5 to 20 parts by weight and

(k) an organic free radical peroxide initiator in an amount of up to about 5%, or up to about 2%, by weight based on the weight of said ethylenically unsaturated materials,

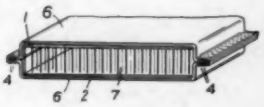
said polymerizable and copolymerizable materials (a), (b), (f) and (g) being different from each other.

4,409,271

LIGHTWEIGHT CONSTRUCTION ELEMENT

Harald Pehr, Gödersdorf, Austria, assignor to Pehr Holding Gesellschaft, Villach, Austria

Filed Dec. 16, 1981, Ser. No. 331,220
Claims priority, application Austria, Dec. 16, 1980, 6114/80
Int. Cl.³ B32B 3/06, 33/00
U.S. Cl. 428—71 8 Claims



1. A lightweight construction element comprising:

an untrimmed velvet fabric comprising;

a first fabric web; and

a second fabric web separated from said first fabric web and peripherally secured thereto;

a plurality of pile yarns linking said first fabric web to said second fabric web at a predetermined distance; and

an airtight pressure resistant coating provided on said first fabric web and on said second fabric web such that an airtight internal chamber is formed having said plurality of pile yarns disposed therein.

4,409,272

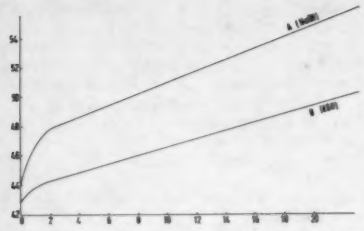
PROCESS FOR THE MANUFACTURE OF COLOR DEVELOPING MATERIAL AND PRODUCT

Graeme McGibbon, Knebworth, England, assignor to The Wiggins Teape Group Limited, Hampshire, England

Continuation of Ser. No. 151,249, May 19, 1980, abandoned.
This application May 13, 1982, Ser. No. 378,013
Claims priority, application United Kingdom, May 22, 1979, 7917814
Int. Cl.³ B32B 5/00, 7/00, 21/04
U.S. Cl. 428—98 11 Claims

1. A process for the manufacture of colour developing material, comprising the steps of dispersing a colour developing reactant consisting essentially of an acidwashed dioctahedral montmorillonite colour developing clay in an aqueous medium, adjusting the pH of the dispersion to an alkaline value by

adding an alkaline potassium compound to the aqueous medium before, during or after dispersion of the clay in the aqueous medium, the particle size of the clay being substantially unaltered whilst the clay is in the presence of the alkaline potassium compound, coating the dispersion on to a web of



sheet material, and drying the thus-coated web whereby the ageing rate of the colour developing material is less than that obtained using a like alkaline sodium compound at the same pH.

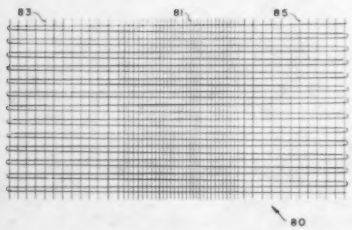
11. Colour developing material manufactured by a process as claimed in claim **1**.

4,409,273

SCRIM FABRIC AND PRODUCT

Edward W. Weitzel, Greenville, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 22, 1980, Ser. No. 218,736
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—109 **1 Claim**



1. A non-woven synthetic fabric comprising: a plurality of polyester fill yarns, a plurality of polyester warp yarns extending over and adhered to the fill yarns in a direction substantially perpendicular thereto, a plurality of polyester warp yarns extending under and adhered to the fill yarns and the warp yarns extending over the fill yarns, the end count of the warp yarns in the center of the fabric being at least twice the end count of the warp yarns at the extremities of the fabric.

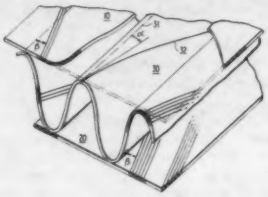
4,409,274

COMPOSITE MATERIAL

Christopher R. Chaplin, Reading; James E. Gordon, Oxfordshire, and Giorgio Jeronimidis, Reading, all of England, assignors to Westvaco Corporation, New York, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,777
Int. Cl.³ B32B *3/28, 5/08, 5/22*
U.S. Cl. 428—112 **17 Claims**

1. A composite structural material assembly comprising two planar face sheets separated by at least one, corrugated sheet having an indulating surface, said face sheets being attached to said corrugated sheet along respective corrugated flute ridge lines, the improvement comprising oriented structural fiber integrally attached to said corrugated sheet so as to follow the



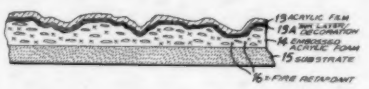
undulating surface of said corrugated sheet at an approximate orientation angle of 15° with said ridge lines.

4,409,275

DECORATIVE LAMINATE

Joseph J. Samowich, 33 Greenwich Ave., New York, N.Y. 10014

Continuation-in-part of Ser. No. 537,445, Dec. 30, 1974, Pat. No. 4,329,386. This application Mar. 10, 1982, Ser. No. 356,656
Int. Cl.³ B32B *3/10, 5/20, 5/22*
U.S. Cl. 428—138 **27 Claims**



1. A laminate comprising:

(a) an intermediate layer of cross-linked thermoset resilient foamed emulsion adhered to;

(b) a substrate

(c) said intermediate layer (a) being self-bonded to the substrate (b)

(d) at least one active compound added to said intermediate layer;

(e) barrier means for substantially preventing ambient elements and said at least one active compound from reacting, said barrier means comprising a plastic surface film of a cross-linked thermoset emulsion self bonded to said intermediate layer;

(f) whereby, said at least one active compound will react to ambient elements only upon said barrier means being at least partially opened to expose a least a portion of said intermediate layer.

4,409,276

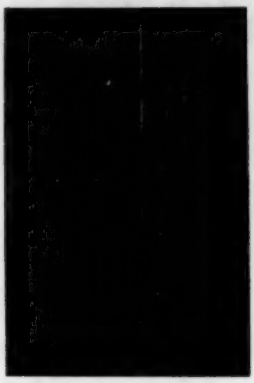
METAL ARTICLE HAVING THREE-DIMENSIONAL WOOD GRAIN AND STAINABLE COATING

Lawrence R. Martinelli, Arlington Heights, and Geronimo E. Lat, Skokie, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jan. 11, 1982, Ser. No. 338,771
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—142 **12 Claims**

1. A metal article having an integral, three-dimensional, simulated wood grain in its surface provided by forming a multitude of grooves in said surface, and applying a stainable, substantially colorless, translucent coating over said simulated wood grain, said coating comprising an acrylic resin and an

extender pigment having an average particle size of about 5 to about 7 microns and a hardness on the Moh scale of no more



than about 4, the ratio of extender pigment to resin is from about 1.5:1 to about 3.6:1 by weight.

4,409,277

VISUAL INFORMATION CARRIER COMPRISING A FLEXIBLE PLASTIC SHEET

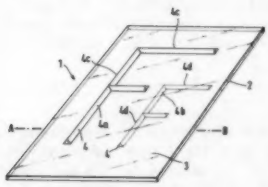
Wolfgang Michel, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Reg. of Germany

Filed Nov. 9, 1981, Ser. No. 319,293

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 8031841[U]

Int. Cl.³ B32B *3/30*; G01D *15/34*

U.S. Cl. 428—156 17 Claims



1. A visual information carrier comprising a single-layer, flexible, transparent, synthetic polymer sheet having a fluorescent dye dispersed therein; said sheet being free from white fracture and having on at least one surface thereof a transparent profiled structure produced by deformation of the sheet; said profiled structure presenting a contrasting visual appearance in comparison to unprofiled regions of said sheet.

4,409,278

BLISTER-FREE DIRECT BONDING OF METALS TO CERAMICS AND METALS

Eric P. Jochym, Baldwinsville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,840

Int. Cl.³ B23K *1/12*

U.S. Cl. 428—163 32 Claims

1. A large area, blister-free assembly formed by direct bonding a metal to a substrate comprising:

a first substrate having two major surfaces; and

a first metallic sheet direct bonded to one of the major surfaces of said first substrate and having a thickness of less than about 0.010 inch, the interface between said first metallic sheet and said first substrate including an eutectic composition, at least one of the surfaces forming said interface including therein a first plurality of channels providing means for venting gases from said interface during the direct bonding operation.

19. In a method for direct bonding a metal sheet to a substrate wherein said metal sheet has a thickness of less than about 0.010 inch, said method being of the type employing a bonding agent compatible with said substrate so as to form an eutectic with said metal sheet, said eutectic consisting predominantly of said metal sheet and exhibiting an eutectic tempera-

ture lower than the melting point of said metal sheet such that heating said metal sheet having an eutectic formed thereon, while said metal sheet is in close contact with said substrate, to at least the eutectic temperature but below the melting point of said metal sheet causes said eutectic to wet said substrate and form a direct bond therewith upon cooling, the improvement comprising the step of:

forming a plurality of channels in at least one of the surfaces forming said direct bond, said channels providing means for venting gases from the interface between said metal sheet and said substrate.

4,409,279

GLASS SUPPORT ROD FOR USE IN ELECTRON-GUN MOUNT ASSEMBLIES

John R. Hale, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,436

Int. Cl.³ B32B *23/02*

U.S. Cl. 428—192 5 Claims

1. For use in an electron-gun mount assembly, a glass support bead comprising a generally rectangular glass body with flat ends, at least two opposite edges at said ends having radii of at least about 0.375 millimeter (15 mils).

4,409,280

DECORATIVE SURFACE COVERINGS

John W. Wiley, Woodstown; Charles H. Brower, Salem, both of N.J., and David Wang, Wilmington, Del., assignors to Mannington Mills, Salem, N.J.

Filed Sep. 21, 1981, Ser. No. 304,164

Int. Cl.³ B32B *3/00*, *7/14*

U.S. Cl. 428—203 7 Claims

1. A surface covering, which comprises:

(a) a backing sheet material;

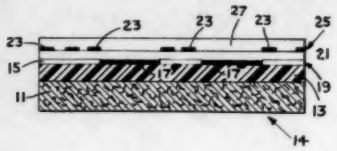
(b) an expanded resinous layer disposed on said backing sheet material;

(c) a first printed design on said expanded resinous layer;

(d) a first substantially translucent or transparent layer overlying said first printed design;

(e) a second printed design of an ink containing decorative

particles selectively deposited on said first substantially translucent or transparent layer; and



(f) a second substantially translucent layer overlying said second printed design.

4,409,281

MAGNETIC RECORDING MEDIUM

Tatsuji Kitamoto, and Goro Akashi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1981, Ser. No. 255,133
Claims priority, application Japan, Apr. 21, 1980, 55-52740
Int. Cl.[3] G11B 5/70; B32B 7/02
U.S. Cl. 428—212 4 Claims

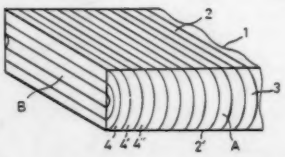
1. A magnetic recording recording medium comprising a first layer comprised in a magnetic iron oxide powder dispersed in a binder formed on a non-magnetic support having a coercive force of from 200 to 700 oersteds, a second layer formed on the first layer comprising a ferromagnetic metal powder dispersed in a binder and having a greater coercive force than that of the first layer of from 600 to 1300 oersteds, and a third layer comprising a thin ferromagnetic metal film formed on the second layer in a thickness of from 0.01μ to 0.5μ and having a coercive force greater than 400 oersteds.

4,409,282

NONWOVEN FABRICS

Shigeo Fujii; Tokuzo Ikeda; Takashi Mikami, and Shuji Okano, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 203,770, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 167,637, Dec. 21, 1979, Pat. No. 4,375,446, and Ser. No. 167,638, Dec. 21, 1979, abandoned. This application Jul. 22, 1982, Ser. No. 401,289
Claims priority, application Japan, May 1, 1978, 53/50745; Nov. 1, 1979, 54/140439
Int. Cl.[3] B32B 7/04
U.S. Cl. 428—219 5 Claims



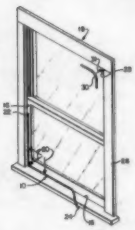
1. A nonwoven fabric consisting essentially of stacked and intertwined long fibers forming thin intertwined layers extending between one surface of said fabric or part thereof, and another surface of said fabric or part thereof.

4,409,283

FORMABLE VISCID CAULKING MEMBER AND METHOD OF MAKING SAME

Donald E. Boyle, Jr., 11 Sullivan Rd., West Quincy, Mass. 02169

Filed Jan. 25, 1982, Ser. No. 342,133
Int. Cl.[3] B65D 53/06, 53/08
U.S. Cl. 428—272 11 Claims



1. A formable viscid caulking member comprising: a viscid medium including 40% to 90% microcrystalline wax and, complementarily, from 60% to 10% refined scale wax; and a flexible multifilament member saturated with said viscid medium.

6. A method for making a formable viscid caulking member comprising:

immersing a length of flexible, multifilament member in a heated liquid viscid medium including a microcrystalline wax and a substance selected from the group consisting of refined scale wax, aliphatic hydrocarbon resins, homopolymers, copolymers, natural resins and natural fillers and allowing said multifilament member to reside therein in a relaxed condition to saturate said multifilament member with viscid medium;

withdrawing said saturated multifilament member from said heated liquid viscid medium;

solidifying said saturated multifilament member; and

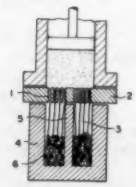
winding the solidified saturated multifilament member on a spool.

4,409,284

POROUS MOLDINGS MADE OF ACCUMULATED MASS OF STRINGY OR THREADY EXTRUDATES

Morihiko Sugino, Kamakura, and Eiji Saura, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 13, 1981, Ser. No. 282,594
Claims priority, application Japan, Jul. 15, 1980, 55-97101; Jul. 15, 1980, 55-97102; Jan. 20, 1981, 56-7598
Int. Cl.[3] B32B 5/02
U.S. Cl. 428—304.4 13 Claims



1. A porous molding produced by a process which comprises providing a mixture of at least one material selected from the group consisting of porous inorganic materials and organic materials capable of being carbonized and at least one binder therefor, forming an accumulated mass of thready extrudates

of said mixture, and drying and sintering said accumulated mass, said porous molding having fine pores present in said thready extrudates themselves and voids established among said thready extrudates and formed by putting extrudates on themselves; wherein said thready extrudate has a sectional area of below 8 mm^2; and wherein the porosity of said porous molding is above 0.2 cc/g when determined from a reduction in volume of mercury by immersing said porous molding in mercury after degassing and applying a pressure to the mercury.

4,409,285

SURFACE-MODIFYING COATING COMPOSITIONS

Martin S. Swerdlow, New Barnet, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 3, 1981, Ser. No. 317,851

Claims priority, application United Kingdom, Nov. 10, 1980, 8036086

Int. Cl.³ A32B *5/22, 13/12*

U.S. Cl. 428—332 **1 Claim**

1. An optical surface, on which the undesirable effects of surface misting and light reflection are reduced, which comprises a substrate having a coated layer comprising silica and/or alumina particles and a polymeric binder wherein at least some of the particles protrude from the surface of the polymeric in the coated layer, said particles comprising a small particle size component having an average particle size in the range 7 to 50 nm and present in an amount from 20 to 98% by weight and a large particle size component having an average particle size in the range 75 to 150 nm and present in an amount from 5 to 65% by weight.

4,409,286

COMPOSITE THERMOPLASTIC FILMS AND A PROCESS FOR THEIR PREPARATION

Jean-Claude Decroix, Arras, France, assignor to Societe Chimique des Charbonnages-CDF Chimie, Paris, France

Filed May 17, 1982, Ser. No. 378,903

Claims priority, application France, May 15, 1981, 81 09684

Int. Cl.³ B32B *27/10, 27/08;* **B28B** *3/20*

U.S. Cl. 428—332 **8 Claims**

1. A composite film consisting essentially of at least one layer of a thermoplastic film having a thickness of from 25 to 3,000 μm and selected from the group consisting of low density polyethylene, polypropylene, polybutene, polyamide, polystyrene and polyvinyl chloride and a layer of a terpolymer film comprising from 88 to 98.7 mol% of units derived from ethylene, from 1 to 10 mol% of units derived from an ester selected from the group consisting of alkyl acrylates and alkyl methacrylates, the alkyl group having from 1 to 6 carbon atoms, and from 0.3 to 3 mol% of units derived from maleic anhydride.

4,409,287

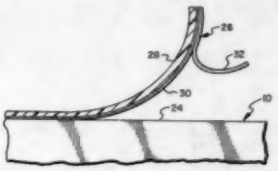
SKI PROTECTIVE DEVICE

Thomas B. Harrison, 534 Highland Blvd., Richardson, Tex. 75081

Filed Jun. 9, 1981, Ser. No. 271,833

Int. Cl.³ A63C *5/00*

U.S. Cl. 428—343 **2 Claims**



1. A protective covering for use on the upper surface of a snow ski comprising a sheet of a plasticized mixture of ionomer resin and polyethylene resin, and a layer of pressure-sensitive adhesive resin bonded to one side of said plasticized sheet.

4,409,288

EPOXY RESIN EMULSION FINISHES FOR CARBON FIBERS

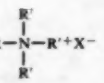
Raymond G. Spain, Huntington Beach, Calif., assignor to Hitco, Irving, Calif.

Filed Apr. 28, 1982, Ser. No. 372,673

Int. Cl.³ B32B *9/00;* **D02G** *3/00*

U.S. Cl. 428—367 **16 Claims**

1. In a method of treating carbon fibers to provide an epoxy resin finish thereon in which an aqueous emulsion of an epoxy resin is applied to said fibers and said fibers are thereafter dried, the improvement which comprises using an effective amount of a two component emulsifying system in said epoxy resin emulsion, one of said emulsifying components being a long chain aliphatic alcohol containing from eight to 18 carbon atoms, the other emulsifying component being a quaternary ammonium salt having the formula:



wherein R is an aliphatic radical containing from 12 to 18 carbon atoms, or a mixture of such radicals, each R′ may be the same or different radicals selected from methyl and ethyl, and X is bromine or chlorine.

4,409,289

CELLULOSE-ACRYLONITRILE POLYMER SOLUTIONS, ARTICLES, AND METHODS OF MAKING SAME

Jacques Menault, Charbonnieres-les-Bains, and Henry Rodier, Sainte-Foy-les-Lyon, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 147,221, May 6, 1980, Pat. No. 4,377,648. This application Sep. 14, 1982, Ser. No. 418,184

Claims priority, application France, May 14, 1979, 79 12383; Mar. 13, 1980, 80 05963

Int. Cl.³ B32B *23/02, 27/02;* **D01D** *5/06, 5/12*

U.S. Cl. 428—374 **8 Claims**

1. Fibres, filaments and yarns based on cellulose and an acrylonitrile polymer, wherein the weight ratio of cellulose/acrylonitrile polymer is between 0.1 and 1, each consituent is in the form of a continuous three-dimensional system of which the fibrils, which are orientated approximately along the axis of

the fibre, are closely interwoven, and the cellulose is in the form of macromolecules which are partially involved in a three-dimensional crystal lattice characteristic of cellulose II.

4. Process for the production of yarns and fibres comprising extruding a solution consisting essentially of (a) cellulose having a degree of polymerisation of at least 200, (b) an acrylonitrile polymer, (c) dimethylsulphoxide and (d) formaldehyde.

the weight ratio of cellulose/acrylic polymer being between 0.1 and 1,

the weight ratio of formaldehyde/cellulose being between 0.2 and 2 and

the total polymer concentration being between 18 and 30% by weight

into a coagulating bath consisting essentially of 25 to 80% by volume of water and 75 to 20% by volume of dimethylsulphoxide, said bath being maintained at a temperature between 0° and 40° C., the filaments are thereafter orientated, and the filaments are at least substantially freed of solvent.

4,409,290
ADHESION OF RUBBER TO GLASS FIBERS

Richard M. Wise, Uniontown, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 331,549, Dec. 17, 1981, Pat. No. 4,355,131, which is a continuation-in-part of Ser. No. 228,844, Jan. 26, 1981, abandoned. This application Jul. 22, 1982, Ser. No. 400,781

Int. Cl.³ B32B *17/04*

U.S. Cl. 428—378 **12 Claims**

1. A bonded composite material comprising a glass fiber reinforcing element embedded in a vulcanized rubber, said element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition comprising (a) 100 parts by weight of a rubbery graft compolymer of a seed of (1) a polymer of an acrylate monomer, said polymer having a glass transition temperature of not above about −20° C., said polymer optionally additionally containing copolymerized with said acrylate monomer a very minor amount by weight of a crosslinking polyunsaturated monomer, and a shell of (2) a copolymer of a vinyl pyridine monomer having from 7 to 9 carbon atoms and a conjugated diene monomer having from 4 to 6 carbon atoms, wherein in said graft copolymer the total amount of said monomers forming said graft copolymer is from about 8 to 20% by weight of said acrylate monomer, from 3 to 20% by weight of said vinyl pyridine monomer and from 60 to 89% by weight of said conjugated diene monomer and (b) from about 3 to 15 parts by weight of a water soluble thermosetting phenolic-aldehyde resin, said composition forming a bond between said element and said rubber.

4,409,291
MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Akira Kasuga; Yasuo Tamai, and Yasuyuki Yamada, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1981, Ser. No. 247,573

Claims priority, application Japan, Mar. 26, 1980, 55-38405

Int. Cl.³ H01F *10/02*; B32B *27/40*

U.S. Cl. 428—425.9 **10 Claims**

1. A magnetic recording medium, comprising:

a non-magnetic support; and

a magnetic layer formed on a surface of said non-magnetic support, said layer comprising fine ferromagnetic particles dispersed in a binder, said binder comprised of:

a polyester polyurethane in an amount of at least 5 wt%, said polyester polyurethane prepared by reacting poly(1,6-hexane adipate) with 4,4-diphenylmethane diisocyanate; and

a vinyl chloride acetate resin selected from the group consisting of vinyl chloride/vinyl acetate copolymer, vinyl chloride/vinyl acetate/vinyl alcohol copolymer and vinyl chloride/vinyl acetate/maleic anhydride copolymer.

4,409,292
VITREOUS MATERIAL AND SEMICONDUCTOR COMPONENT INCORPORATING SAME

Jean-Paul Parant, Arpajon, France, assignor to Societe Anonyme dite Compagnie General d'Electricite, Arpajon, France

Filed Jul. 9, 1982, Ser. No. 396,950

Claims priority, application France, Jul. 9, 1981, 81 13497

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—428 **2 Claims**

2. A semiconductor component comprising a silicon part and a layer of a vitreous material adhering to an outer surface of said part, said vitreous material comprising, by weight:

30% to 40% zinc oxide ZnO,

15% to 30% lead oxide PbO,

20% to 40% boron oxide B_2O_3,

5% to 20% silicon dioxide SiO_2,

2% to 10% aluminum titanate Al_2TiO_5, and

0% to 5% bismuth oxide Bi_2O_3.

4,409,293
WOOD COMPOSITES OF LOW FORMALDEHYDE EMISSION

James H. Williams, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Filed Sep. 10, 1982, Ser. No. 416,574

Int. Cl.³ B32B *27/42*

U.S. Cl. 428—524 **31 Claims**

1. A process for bonding lignocellulosic material under heat and pressure, where the bonded lignocellulosic material is characterized by a low emission of formaldehyde, which comprises

applying a binder to said lignocellulosic material, said binder comprising a urea-formaldehyde base resin having a molar ratio of formaldehyde to urea of 1.0:1–1.2:1, said base resin having essentially no free formaldehyde and said base resin when cured containing substantially more methylene groups than methylene ether groups,

consolidating said lignocellulosic material and curing the binder.

9. An improved pressed composite of lignocellulosic material bound together by a urea-formaldehyde binder, which composite is characterized by reduced emission of formaldehyde, wherein the improvement comprises using as said binder a urea-formaldehyde base resin having a molar ratio of formaldehyde to urea of 1.0:1–1.2:1, said base resin having no free formaldehyde and said base resin when cured contains substantially more methylene groups then methylene ether groups.

17. A process for adhesively securing a first item to a second using a curable urea-formaldehyde resin, comprising

disposing between a first item and a second item a curable urea-formaldehyde resin having a molar ratio of formaldehyde to urea of 1.0:1–1.2:1 said resin containing essentially no free formaldehyde and being curable to a structure containing substantially more methylene groups than methylene ether groups, and then

curing said resin to bind said items together.

4,409,294
SLIDING MEMBER FOR USE IN AN INTERNAL COMBUSTION ENGINE

Takeshi Hiraoka, Ageo; Yoshikatsu Nakamura, Omiya, and Osamu Kawamura, Urawa, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,927

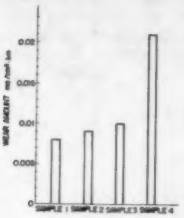
Claims priority, application Japan, May 29, 1980, 55/70831

Int. Cl.³ B22F *9/00*

U.S. Cl. 428—553 **1 Claim**

1. A sliding member for use in an internal combustion en-

gine, said member having a sliding surface formed by flame-spraying a mixture of (a) 50 to 97% of high carbon ferrochromium and (b) 3 to 50% by weight of high-carbon iron containing at least 0.6% by weight carbon.

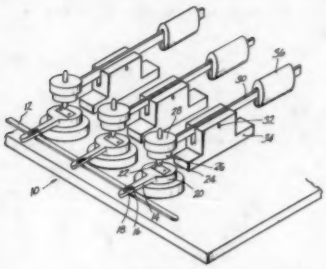


4,409,295

ELECTRICAL CONNECTOR MATERIAL

Edward F. Smith, III, Madison, and F. Dennis Gyurina, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 21, 1982, Ser. No. 341,354
Int. Cl.³ B32F 15/04; H01H 1/02
U.S. Cl. 428—591 10 Claims



1. A static electrical connector arrangement, comprising:
a first element having a first contact surface thereon, said first element comprising a first metal substrate having a copper base alloy comprising from about 2 to about 12% aluminum, about 0.001 to about 3% silicon, and the balance essentially copper;
a second element having a second contact surface thereon, said second contact surface being a gold or gold base alloy; and
means for pressing said first contact surface against said second contact surface whereby substantial elimination of fretting debris buildup between the contact surfaces is achieved.

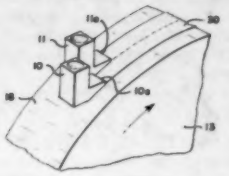
4,409,296

RAPIDLY CAST ALLOY STRIP HAVING DISSIMILAR PORTIONS

Brian L. Ward, Woking, England, assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Oct. 22, 1980, Ser. No. 199,149
Claims priority, application United Kingdom, May 9, 1979, 7916035
Int. Cl.³ B32B 15/00
U.S. Cl. 428—610 21 Claims

1. A rapidly quenched, thin cast metallic strip having an upper face and a lower face; said strip comprising a plurality of rapidly quenched, cast metallic dissimilar portions of at least two different compositions cast edge-to-edge, each portion having contacted a casting surface and metallurgically alloy-bonded during casting to an adjacent portions along the edges of said dissimilar portions of said strip; said strip having the metallurgical bond formed at a transition zone between portions having a width of less than five times the average thickness of the bonded portions and extending through the strip thickness from one face to the other face of the strip.



4,409,297

COMPOSITE SUPERCONDUCTORS

David G. Howe, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1981, Ser. No. 263,664
Int. Cl.³ B32B 15/20
U.S. Cl. 428—614 15 Claims

1. A composite superconductor comprising:
a first reactant alloy selected from the class consisting of Cu-aGa wherein a is from about 0.4 to about 22 at. %, Cu-bGa-cAl wherein b is from about 0.4 to about 20 at. % and c is from about 0.1 to about 6, Cu-dSn wherein d is from about 1 to about 11, and Cu-eSi wherein e is from about 0.5 to about 14;
a second reactant alloy of a ternary alloy selected from the class consisting of Nb-fSn-yX, V-gGa-yX, and V-hSi-yX wherein X is selected from the class consisting of yttrium, tellurium, cerium, lanthanium, erbium, gadolinium, and mixtures thereof, f is from about 0.1 to about 12, g is from about 0.4 to about 12.5, h is from about 0.5 to 9, and y is an amount up to 300 percent of the solubility limit of X in said alloy; and
a continuous intermediate layer of an intermetallic A-15 compound between said first and second alloys, said layer being produced by a solid state reaction between said alloys.

4,409,298

CASTABLE METAL COMPOSITE FRICTION MATERIALS

Clarence E. Albertson, Villa Park; John A. Horwath, Palatine, both of Ill., and Duane W. Lashua, Brillion, Wis., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 21, 1982, Ser. No. 400,318
Int. Cl.³ B22D 19/00
U.S. Cl. 428—614 3 Claims

1. A metal composite friction material having an average dynamic coefficient of friction greater than 0.2 comprising

from 99 to 85 wt% of a metal matrix and correspondingly from about 1 to about 15 wt% of at least one solid particulate component having a surface composition which is not wet by the metal matrix when liquid, said metal matrix formed of an alloy of aluminum containing no more than 80 wt% aluminum and selected from the group consisting of aluminum-silicon alloy, aluminum-silicon-zinc alloy and aluminum-zinc alloy, and said solid particulate component being homogeneously dispersed within said metal matrix.

4,409,299

MAGNETIC RECORDING MEDIUM

Chiaki Mizuno; Yasuo Tamai, and Akira Kasuga, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 2, 1982, Ser. No. 353,789
Claims priority, application Japan, Mar. 2, 1981, 56-29549
Int. Cl.³ G11B *5/70*; H01F *10/02*; B32B *27/30*
U.S. Cl. 428—694 **17 Claims**

1. A magnetic recording medium, comprising:
a non-magnetic flexible support base;
a magnetic recording layer formed on a surface of said support base, the layer comprised mainly of fine ferromagnetic particles and a binder, the binder comprised of:
a vinyl chloride/vinyl acetate/vinyl alcohol copolymer; and
a vinyl chloride/vinylidene chloride copolymer.

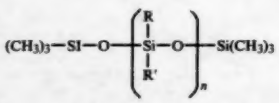
4,409,300

MAGNETIC RECORDING MEDIUM

Takehisa Ohkawa, Usuda, and Kuniichi Yoda, Saku, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,055
Claims priority, application Japan, Apr. 1, 1981, 56-47315
Int. Cl.³ G11B *5/70*; H01F *10/02*
U.S. Cl. 428—695 **9 Claims**

1. A magnetic recording medium comprising a base material and a magnetic coating layer thereon comprised of a magnetic material dispersed in a binder, characterized in that the magnetic coating layer contains a highly viscous silicone oil having a viscosity of 100,000 centistokes or more in combination with a sorbitan fatty acid ester, said silicone oil being represented by the general formula:



wherein R is CH_3, R' is CH_3, C_6H_5 or F and n is a number which determines the viscosity of said silicone oil; and wherein said silicone oil is used in an amount of from 0.2 to 2 percent by weight, and the sorbitan fatty acid ester is used in an amount of from 0.5 to 4 percent by weight, each based on the weight of the binder.

4,409,301

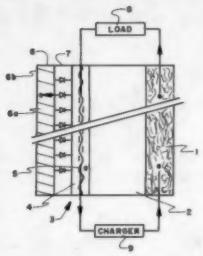
BIFUNCTIONAL GAS DIFFUSION ELECTRODE

Herman F. Angerer, Biel-Benken, and Nenad R. Tomov, Geneva, both of Switzerland, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Dec. 21, 1981, Ser. No. 332,519
Int. Cl.³ H01M *4/00*
U.S. Cl. 429—27 **11 Claims**

1. A composite bifunctional porous gas-diffusion electrode operative alternately for gas consumption and gas evolution, comprising a gas-side layer operative for gas consumption, an electrolyte-side layer operative for gas evolution and current-collection means associated with the electrolyte-side layer, characterized in that it comprises an intermediate rectifying layer of semi-conducting material between the gas-side layer and the electrolyte-side layer.

11. A secondary metal-gas battery comprising a metal electrode, a porous gas-diffusion bifunctional electrode having a gas-side layer operative during discharge for gas consumption, an electrolyte-side layer operative during charging for gas evolution and current-collection means associated with the



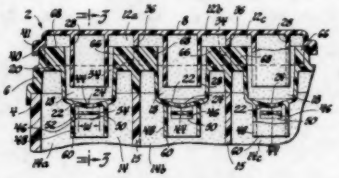
electrolyte-side layer, electrolyte between the metal electrode and the electrolyte-side of the bifunctional electrode, and means for supplying gas to the gas-side layer of the bifunctional electrode, characterized in that the bifunctional electrode comprises an intermediate rectifying layer of semiconducting material between the gas-side layer and the electrolyte-side layer.

4,409,302

VENTING SYSTEM FOR ELECTRIC STORAGE BATTERY

David T. Poe, Yorktown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1981, Ser. No. 305,096
Int. Cl.³ H01M *2/12*
U.S. Cl. 429—88 **5 Claims**



1. In an electric storage battery having a venting system for relieving gases from the innards of the battery including an electrolyte trapping chamber defined in part by a floor sloping toward an electrolyte drainage aperture at the low point of the floor and proximate the electrolyte level within the battery, the improvement comprising: a rim defining said aperture and a tongue-like drip tab depending at an acute angle from the underside of said rim so as to extend beneath said aperture and promote the running off of electrolyte from said floor back to said innards which electrolyte, but for the tab, would otherwise accumulate on said floor and plug said aperture.

4,409,303

CATALYTIC CATHODE FOR PRIMARY AND SECONDARY FLUID CATHODE DEPOLARIZED CELLS

William L. Bowden, Nashua, N.H., assignor to Duracell Inc., Bethel, Conn.

Filed Mar. 4, 1982, Ser. No. 354,689
Int. Cl.³ H01M 4/36
U.S. Cl. 429—105 9 Claims

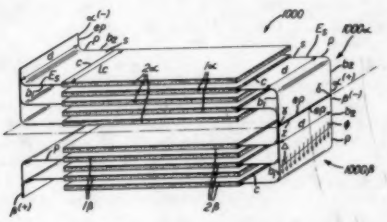
1. A non-aqueous electrochemical cell comprising an active metal anode, an electrolyte salt dissolved in a fluid cathode depolarizer and a catalytic cathode comprised of at least one graphite intercalated metal halide.

4,409,304

ELECTROCHEMICAL DEVICE COMPRISING AT LEAST TWO CELLS CONNECTED IN ELECTRICAL SERIES

Francois Gerard, and Jean-Yves Machat, both of Clermont-Ferrand, France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Feb. 25, 1982, Ser. No. 352,368
Claims priority, application France, Feb. 27, 1981, 81 04155
Int. Cl.³ H01M 2/24
U.S. Cl. 429—158 17 Claims



1. An electrochemical device comprising at least two cells, each cell comprising at least one positive electrode and at least one negative electrode in the form of plates, characterized by the following features:

(a) each plate is joined on at least one side to a current outlet which in turn is joined to an electron-conductive extension which is formed of blades or has blades, said blades being distributed substantially over the entire distance between the extreme edges of the corresponding assembly;

(b) the extension corresponding to each plate abuts at its so-called "free" end at a terminal, called the "cell terminal", of the same polarity as the plate, or, at least in part, constitutes such a terminal at its "free" end, each cell thus having at least one positive terminal and at least one negative terminal, at least one side of the device having terminals of opposite signs by crisscrossing of blades of opposite signs, the device having means for avoiding electrical contact at the places where the blades cross one another;

(c) the electrical junction between each plate and its outlet is effected substantially over the entire corresponding side of the plate;

(d) each outlet and the corresponding extension form an assembly located outside of the plate; the distance between the extreme edges of this assembly is substantially equal to the length of the corresponding side of said plate, from said plate up to the "free" end of the corresponding extension, these extreme edges abutting at said plate;

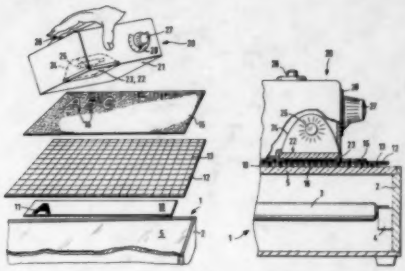
(e) the two cells are connected in electrical series by at least two terminals of the cells; the electrical junction between these two terminals is effected substantially over said entire distance between extreme edges in the case of each extension which abuts at one of these terminals or which, at least in part, constitutes by its "free" end one of these terminals.

4,409,305

METHOD FOR PRODUCING CHARACTERS AND OTHER REPRESENTATIONS, IN PARTICULAR TITLE SET, ON A PHOTO MATERIAL

Fred A. Goetschi, Haus zum Anker, CH-6354 Vitznau, Switzerland

Filed Mar. 19, 1981, Ser. No. 245,516
Claims priority, application European Pat. Off., Sep. 23, 1980, 80 105 701.9
Int. Cl.³ G03C 5/08, 5/18
U.S. Cl. 430—22 10 Claims



1. A method of photographically producing characters or other representations under daylight conditions, such as title set, utilizing photomaterial in sheet form which is generally insensitive with respect to daylight or blue light and having a predetermined sensitivety with respect to short-wave light, in conjunction with a suitable developer liquid, a transparent cover film which is non-transmissive with respect to said developer liquid and a record carrier film which has at least one transparent region in the form of a character, symbol, picture, photo or other like representation surrounded by a ground which is opaque with respect to short-wave light to thereby provide a photostenciling implement, including the steps of:

(a) wetting said photomaterial with said developing liquid,

(b) covering said wetted photomaterial with said transparent cover film,

(c) relatively positioning said record carrier film and said transparent cover film such that said one transparent region is juxtaposed to where its projected image is to be produced on said photomaterial,

(d) irradiating said one transparent region with short-wave light so as to activate the photomaterial in the area juxtaposed to said one transparent region to thereby provide a corresponding image on the photomaterial which becomes immediately visible to the naked eye in daylight conditions.

4,409,306

METHOD OF PREPARING A PHOSPHOR SUSPENSION

Volker Gerstle, Wendlingen; Gerhard Mauz, Kongen, and Rolf Zondler, Stuttgart, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 2, 1982, Ser. No. 355,018
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110476
Int. Cl.³ G03C 1/66
U.S. Cl. 430—28 5 Claims

1. Method of preparing a phosphor suspension by mixing a photosensitive material, a photosensitizer, and a phosphor for the purpose of forming a photosensitive film, characterized in that the photosensitizer in the suspension is a chromic-acid solution.

4,409,307

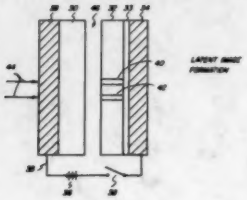
ELECTRICALLY ACTIVE INORGANIC INTERLAYER FOR ELECTRICALLY ACTIVATABLE RECORDING

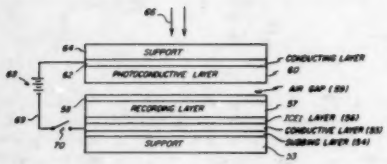
Mark Lelental, Rochester; Arthur A. Rasch, Webster, and David P. Sullivan, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,770

Int. Cl.³ G03G *13/00, 13/22*

U.S. Cl. 430—31 **25 Claims**





1. In an electrically activatable recording element comprising an electrically conductive support bearing

(a) a first layer, and, contiguous to the first layer,

(b) an electrically activatable recording layer,

the improvement wherein

said first layer (a) is an inorganic electrically active conductive layer consisting essentially of a compound selected from the group consisting of silver chloride, silver bromide, silver iodide, transition metal bromides and chlorides, alkali metal chlorides, bromides and iodides, and combinations thereof capable upon electrically activated exposure and processing of said element of enhancing image formation in said electrically activatable recording layer.

22. A dry electrically activatable recording process for producing a dye image and a silver image in an electrically activatable recording element comprising, in sequence:

(a) an electrically conductive layer,

(b) a photoconductive layer,

(c) an electrically activatable recording layer separated from (b) by either (i) an air gap of up to 20 microns or (ii) an electrically conductive polymeric layer, and comprising, in an electrically conductive binder,

(A) a dye-forming coupler, and

(B) an oxidation-reduction combination comprising

(1) an organic silver salt oxidizing agent with

(2) a reducing agent for the organic silver salt oxidizing agent, wherein the reducing agent in its oxidized form, forms a dye with the dye-forming coupler,

(d) an electrically active conductive layer consisting of a compound selected from the group consisting of silver chlorides, silver bromides, silver iodides, transition metal bromides and chlorides, alkali metal chlorides, bromides and iodides, and combinations thereof, on

(e) an electrically conductive support,

said process comprising the steps:

(I) imagewise altering the conductivity of said photoconductive layer in accord with an image to be recorded,

(II) applying an electrical potential across said photoconductive layer and said recording layer of a magnitude and for a time sufficient to produce a latent image in the recording layer corresponding to the image to be recorded; and,

(III) heating said recording layer substantially uniformly at a temperature and for a time sufficient to produce a dye image and a silver image in said recording layer.

4,409,308

PHOTOCONDUCTIVE MEMBER WITH TWO AMORPHOUS SILICON LAYERS

Isamu Shimizu, Yokohama; Shigeru Shirai, Yamato, and Eiichi Inoue, Tokyo, all of Japan, assignors to Canon Kabuskiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 308,238

Claims priority, application Japan, Oct. 3, 1980, 55-138980; Oct. 3, 1980, 55-138981; Oct. 8, 1980, 55-140960; Oct. 8, 1980, 55-140961; Oct. 8, 1980, 55-140962

Int. Cl.³ G03G *5/14, 5/04*

U.S. Cl. 430—60 **98 Claims**

1. A photoconductive member comprising:

a support, a photoconductive layer constituted of an amorphous material containing silicon atoms as matrix and containing hydrogen atoms or halogen atoms, and an intermediate layer provided between them, side intermediate layer having a function to bar penetration of carriers from the said of the support into the photoconductive layer and to permit passage from the photoconductive layer to the support of photocarriers generated in the photoconductive layer by projection of electromagnetic waves and movement of the photocarriers toward the side of the support, and said intermediate layer being constituted of an amorphous material containing silicon atoms and oxygen atoms as constituents.

4,409,309

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Kozo Oka, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1981, Ser. No. 288,865

Claims priority, application Japan, Jul. 31, 1980, 55-104317; Feb. 3, 1981, 56-13779

Int. Cl.³ G03G *5/08, 5/06*

U.S. Cl. 430—65 **21 Claims**

1. An electrophotographic light-sensitive element comprising an electrically conductive support having provided thereon, in sequence, a photoconductive layer and a protective layer, wherein said protective layer has a thickness of from 1 to 30 μm and contains a powder of a metal oxide having a volume intrinsic resistance of 10^{11} Ω-cm or less in an amount of from 10 to 40% by weight based on the total weight of the protective layer and a mean particle size of 0.3 μm or less dispersed in a binder resin, said protective layer being substantially transparent in wavelength regions of light to which said photoconductive layer is sensitive.

4,409,310

SURFACE DOPED INORGANIC ELECTROPHOTOGRAPHIC PHOTOSENSITIVE PARTICLES IN BINDER

Kazumi Okano, Fuchu; Yuji Nishigaki, Yokohama, and Masanao Kasai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 188,122, Sep. 17, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,657

Claims priority, application Japan, Sep. 20, 1979, 54-121504

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ G03G 5/087, 5/09

U.S. Cl. 430—95 5 Claims

1. An electrophotographic photosensitive member which comprises a photoconductive layer comprising a binder having dispersed therein inorganic photoconductive particles on the surface of which a water insoluble compound of a metal element of Group VII of the Periodic Table is deposited by reacting a water soluble compound of a metal element of Group VIII of the Periodic Table with a reagent which is capable of producing said water insoluble compound in the presence of said inorganic photoconductive particles.

4,409,311

PHOTOSENSITIVE MEMBER

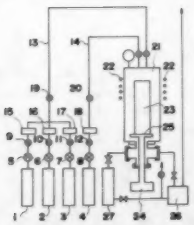
Takao Kawamura, Senboku Seiwadai Koporasu 717-Go, 398-1, Tsujino, Sakai-Shi, Osaka-Fu, and Yoshida Masazumi, Amagasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha; Takao Kawamura and Kyoto Ceramic Co., Ltd., all of, Japan

Filed Mar. 8, 1982, Ser. No. 355,377

Claims priority, application Japan, Mar. 25, 1981, 56-44498; Mar. 25, 1981, 56-44499

Int. Cl.³ H01L 45/00; B05P 5/12

U.S. Cl. 430—95 5 Claims



1. A photosensitive member which comprises an amorphous silicon photoconductive layer containing about 10 to 40 atomic % of hydrogen, 10^{-5} to 4×10^{-2} atomic % of oxygen and about 10 to 20,000 ppm of Group IIIA impurity of the Periodic Table, said photoconductive layer exhibiting infrared absorption peaks between wavenumber of 2000 cm^{-1} where Si-H bonds are predominant and wavenumber of 2090 cm^{-1} where Si-H_2 bonds are predominant and wherein the ratio of infrared absorption coefficient peak at wavenumber 2090 cm^{-1} to that of peak at wavenumber 2000 cm^{-1} is within the range of 0.2 to 1.7.

4,409,312

DRY DEVELOPER FOR ELECTROSTATIC IMAGE WITH AL OR TI ALKOXIDE

Toshimitsu Ikeda, Himeji; Nobuyasu Honda, Tenri, and Tetsuya Nakano, Osaka, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Feb. 23, 1982, Ser. No. 351,445

Claims priority, application Japan, Feb. 23, 1981, 56-24264

Int. Cl.³ G03G 9/08, 9/14

U.S. Cl. 430—110 12 Claims

1. A dry developer for an electrostatic image, which comprises molded particles of a dispersion of a binder medium, a wax and a pigment, wherein a combination or partial reaction product of (A) a copolymer of an olefin with a polar group-containing, ethylenically unsaturated monomer and (B) a metal alkoxide of aluminum or titanium is incorporated as a cross-linking agent into said molded particles and wherein 1 to 25 parts by weight of the copolymer (A) and 0.2 to 5 parts by weight of the metal alkoxide (B) are contained per 100 parts by weight of the sum of the binder resin and the wax.

4,409,313

POWDER DEPOSITION TO FORM PATTERN ON LIGHT IMAGED PHOTOSENSITIVE DIAZONIUM SALT COATING HAVING SALT OF AROMATIC AMINE

Hajime Morishita, Tokyo; Takahiro Kohashi, Hachioji; Saburo Nonogaki; Motoo Akagi, both of Tokyo; Nobuaki Hayashi, and Shoichi Uchino, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

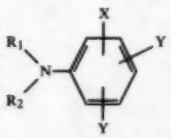
Division of Ser. No. 279,849, Jul. 2, 1981, Pat. No. 4,377,630. This application Sep. 29, 1982, Ser. No. 427,586

Claims priority, application Japan, Jul. 4, 1980, 55-90650; Jun. 5, 1981, 56-85719

Int. Cl.³ G03C 5/34; H01J 9/227

U.S. Cl. 430—144 12 Claims

1. A process for forming a pattern of powder coat layer comprising the steps of coating a substrate with a photosensitive composition containing an aromatic diazonium salt which gets sticky upon exposure to light and a salt of a compound represented by the general formula:



(wherein R_1 and R_2 each represents a straight chain alkyl group, and X, Y and Z each represents H, a straight chain alkyl group or an alkoxy group, but two or more of X, Y and Z can not be H at the same time) to form a thin coat layer on said substrate, subjecting said thin layer to pattern light exposure to make the exposed part sticky, and contacting the powder particles with the exposed thin layer to have the powder deposited on the exposed part.

4,409,314

LIGHT-SENSITIVE COMPOUNDS, LIGHT-SENSITIVE MIXTURE, AND LIGHT-SENSITIVE COPYING MATERIAL PREPARED THEREFROM

Gerhard Buhr, Koenigstein; Hans Ruckert, and Paul Stahlhofen, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,154

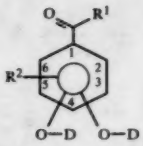
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040157

Int. Cl.³ G03C 1/60, 1/54; C07C 113/00

U.S. Cl. 430—192 15 Claims

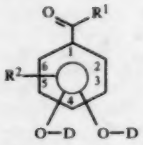
1. A light-sensitive mixture which contains a water-insoluble resinous binder, which is soluble or swellable in aqueous-alka-

line solutions, and a 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a dihydroxyacylophenone or of a dihydroxybenzoic acid ester, wherein the sulfonic acid ester corresponds to the formula I



in which R^1 is an alkyl radical having 4 to 17 carbon atoms or an alkoxy radical having 4 to 17 carbon atoms, the carbon chain of which can be interrupted by ether oxygen atoms, R^2 is a hydrogen atom, an alkyl radical having 1 to 3 carbon atoms, or a chlorine or bromine atom, and D is a 1,2-naphthoquinone-2-diazide-sulfonyl radical.

10. A 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a dihydroxyacylophenone or of a dihydroxybenzoic acid ester, wherein the sulfonic acid ester corresponds to the formula I



in which R^1 is an alkyl radical having 4 to 17 carbon atoms or an alkoxy radical having 4 to 17 carbon atoms, the carbon chain of which can be interrupted by ether oxygen atoms, R^2 is a hydrogen atom, an alkyl radical having 1–3 carbon atoms, or a chlorine or bromine atom and D is a 1,2-naphthoquinone-2-diazide-sulfonyl radical.

4,409,315

REDUCING POST-PROCESS D_{min} INCREASE IN POSITIVE REDOX DYE-RELEASING IMAGE TRANSFER SYSTEMS USING OXIDANTS IN COVER SHEETS

Eugene A. Armour; Richard P. Henzel, and Rowland G. Mowrey, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,508
Int. Cl.³ G03C *1/40, 5/54*
U.S. Cl. 430—214 **26 Claims**

1. In a photographic assemblage to be processed with an electron transfer agent, said assemblage comprising:

(a) a photographic element comprising a support having thereon a dye image-receiving layer and at least one photosensitive silver halide emulsion layer having associated therewith a nondiffusible, positive-working, redox dye-releaser capable of releasing a diffusible dye upon reduction; and

(b) a transparent cover sheet located over the layer outermost from said support;

the improvement wherein said cover sheet contains an oxidant having an electrode potential of from about −200 mV up to about +1000 mV versus a saturated calomel electrode at a pH of about 5 to about 6, said oxidant being capable of oxidizing said electron transfer agent, and the reduced form of said oxidant being incapable of reducing said positive-working redox dye-releaser.

4,409,316

RESISTIVELY HEATABLE PHOTOTHERMOGRAPHIC ELEMENT WITH STRIPPABLE LAYER

Jeanine I. Zeller-Pendrey, Woodbury; Mark C. Skinner, Afton Township, Washington County, and David A. Morgan, Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 26, 1982, Ser. No. 352,648
Int. Cl.³ G03C *1/90, 1/84, 1/02*
U.S. Cl. 430—263 **8 Claims**

1. A photothermographic element comprising a support base having on one surface thereof a photothermographically imageable layer and adhered to the opposite surface of said support base a strippable layer having a resistance of between 60 and 1,500 ohms per square.

7. The element of claims **1**, **2** or **5** wherein said support base is a transparent polyethylene terephthalate polymeric resin layer and said strippable layer comprises a mixture of cellulose acetate and cellulose acetate propionate.

4,409,317

RADIATION SENSITIVE COATING COMPOSITION

Hiroshi Shiraishi, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,878
Claims priority, application Japan, Sep. 24, 1981, 56/149420
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—270 **8 Claims**

1. A radiation sensitive coating composition comprising

(a) at least one alkali soluble resin selected from the group consisting of phenolic resins, poly(p-vinylphenol) and halogenated poly(p-vinylphenol)s,

(b) poly(2-methylpentene-1-sulfone), and

(c) isoamyl acetate or a mixture of 90 to 99.9% by volume of isoamyl acetate and 0.1 to 10% by volume of one or more solvents compatible with isoamyl acetate.

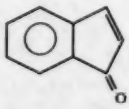
4,409,318

PHOTOSENSITIVE ELEMENT CONTAINING A POLYMER OF AN INDENONE BASED COMPOUND AND A METHACRYLATE COMPOUND

Edwin A. Chandross, Berkeley Heights, and Ray L. Hartless, Lopatcong Township, Warren County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 259,534, May 1, 1980, Pat. No. 4,363,867. This application Aug. 19, 1982, Ser. No. 409,408
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—271 **8 Claims**

1. A photosensitive body comprising a substrate in contact with a photosensitive material, said photosensitive material comprising an organic polymer characterized in that said polymer is formed from the monomers comprising (1) an indenone based compound represented by the formula



and (2) a methacrylate compound represented by the formula

where X is chosen from the group consisting of nitriles, alkyl esters, and carboxylic acid functional groups.

4,409,319

ELECTRON BEAM EXPOSED POSITIVE RESIST MASK PROCESS

James J. Colacino, Stromville, NY, and Ronald A. Leone, Satellite Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,695
Int. Cl.³ G03C 5/04
U.S. Cl. 430—296 11 Claims

1. A method for forming a pattern of openings in an alkali soluble and a photosensitive diazo benzophenone positive resist system, comprising:

forming an adhesion promoter layer on a substrate wherein said adhesion promoter comprises a partially cyclized poly-cis-isoprene photoresist heating said adhesion promoter layer to desensitize it;

forming a layer of said resist system on and over said adhesion promoter layer;

exposing said resist with an electron beam in a predetermined pattern of said openings;

developing said exposed resist system in an alkaline medium at a temperature in the range of about 13° to 15° C.;

determining the time for completion of development of at least one of said openings over a dedicated portion of said substrate, and continuing the development of said resist system for an additional 10 to 100% of said time; and

heating said developed resist pattern over a period of about 20 to about 60 minutes to a final temperature of about 120 to 160±5° C., and baking said resist at said final temperature for a time in the range of about 10 to about 20 minutes, wherein the last said heating is performed in a stepwise manner, with the first bake at a temperature of about 80 to 90±5° C. for about 10 to about 20 minutes, a second bake at a temperature of about 100° to about 120° C. for about 10 to about 20 minutes, and a bake at said final temperature for about 10 to about 20 minutes.

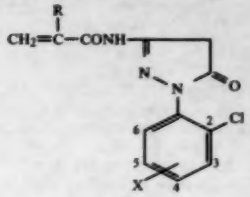
4,409,320

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Morio Yagihara; Tsumoru Hirano; Keiji Mihayashi, and Takashi Ozawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1982, Ser. No. 377,271
Claims priority, application Japan, May 8, 1981, 56-68979
Int. Cl.³ G03C 7/00, 1/40
U.S. Cl. 430—381 16 Claims

16. A method of forming a color image comprising developing an imagewise exposed silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a magenta color image forming polymer coupler latex which is capable of forming a dye upon coupling with an oxidation product of an aromatic primary amine developing agent and which is a polymer or copolymer having a repeating unit derived from a monomer represented by the following general formula (I)



(I)

wherein R represents a hydrogen atom, a lower alkyl group containing from 1 to 4 carbon atoms or a chlorine atom; and X represents a halogen atom, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfonamido group, a sulfamoyl group, a cyano group, or an alkoxycarbonyl group and which is present at the 4-position or 5-position of the phenyl group; wherein said developing is conducted using an alkaline aqueous solution containing an aromatic primary amine developing agent.

4,409,321

METHOD FOR THE REPRODUCTION OF COLOR IMAGE

Kaoru Onodera, Odawara; Toshifumi Iijima, Kokubunji, and Wataru Fujimastu, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jan. 22, 1982, Ser. No. 341,691
Claims priority, application Japan, Jan. 22, 1981, 56-8702
Int. Cl.³ G03C 7/16
U.S. Cl. 430—383 7 Claims

1. A method for the reproduction of a color image which comprises the formation of a dye image on a photographic light-sensitive material, said formation of a dye image being carried out in the manner that a photographic light-sensitive material for camera-exposure use is imagewisely exposed and processed to form a dye image, and through said photographic light-sensitive material having said image, an exposure is made on a photographic printing light-sensitive material and said exposed photographic printing light-sensitive material is then processed in an alkaline activator solution to thereby form a dye image thereon,

said photographic light-sensitive material for camera-exposure use comprising a transparent support provided thereon with a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a blue-sensitive silver halide emulsion layer, said emulsion layers each comprising one of three different couplers selected from nondiffusible couplers capable of forming, by the coupling reaction with the oxidized product of a silver halide developing agent, compounds having spectral absorption maximum wavelength in the wavelength region longer than 340 nm, the spectral absorption maximum wavelength of said compounds being at least 30 nm spaced apart from one another, said blue-sensitive silver halide emulsion layer comprising a coupler capable of forming said compound having the highest molecular extinction coefficient among said three different couplers and said green-sensitive silver halide emulsion layer comprising a coupler capable of forming said compound having the lowest molecular extinction coefficient among said three different couplers, and

said photographic printing light-sensitive material comprising a support provided thereon with three different light-sensitive silver halide emulsion layers having the respective spectral sensitivity thereof corresponding to the respective absorption maximum wavelength of said compounds formed in said photographic light-sensitive material for camera-exposure use, said silver halide emulsion

layers each comprising one of three nondiffusible yellow, magenta, and cyan coupler, and containing a color developing agent and/or the precursor thereof.

4,409,322

SILVER HALIDE PHOTOSENSITIVE MATERIAL

Atsuo Ezaki, and Takeshi Murakami, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1981, Ser. No. 329,292
Claims priority, application Japan, Dec. 19, 1980, 55-181029
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—523 **6 Claims**

1. A silver halide photographic material comprising a support, a silver halide emulsion layer and a protective layer on one side of said support, and a non-photosensitive back layer on the other side of said support wherein silver halide is present in said silver halide emulsion layer in an amount not greater than 30 mg/dm² based on the amount of silver, and a first matting agent in said protective layer and a substantially spherical matting agent in said back layer,

wherein said first matting agent comprising a fine powder of an inorganic compound selected from the group consisting of barium sulphate, desensitized silver halide, zinc dust, manganese colloid, titanium dioxide, silicon dioxide, magnesium oxide and calcium carbonate or a an organic high molecular weight compound selected from the group consisting of polytetrafluoroethylene, cellulose acetate, polystyrene, polymethylstyrene, polymethylmethacrylate, polypropylmethacrylate, polymethylacrylate, butyl polyacrylate and polyethylenecarbonate, and

wherein said spherical matting agent is an organic high molecular weight compound obtained by suspension polymerization thereof.

4,409,323

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Ryosuke Sato, Hino; Yuji Hotta, and Katsumi Matsuura, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,442
Claims priority, application Japan, Feb. 15, 1980, 55-17644
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—544 **9 Claims**

1. A photographic material comprising a light sensitive silver halide emulsion layer provided on a support, said material containing a compound represented by the formula:

A-TIME-PUG,

wherein A is a coupler group capable of a coupling reaction with an oxidized color developing agent, PUG is a photographically useful group, and TIME is a timing group joining said coupler and said photographically useful group and further wherein said timing group is cleavable from said coupler group on reaction of said coupler group with said oxidized color developing agent and further wherein the resulting cleaved timing and photographically useful group entity-TIME-PUG is able to undergo electron transfer along a conjugated system therein to cleave the PUG after the group-TIME-PUG is cleaved from said coupler group A and further wherein one end of TIME is connected with PUG through a methylene group contained in TIME and substituted by R1 and R2, wherein R1 and R2 are individually a hydrogen atom, an alkyl group or an aryl group and wherein the other end of TIME is connected to A at the coupling site of A through an O, S or N atom contained in TIME.

4,409,324

MULTILAYER COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Takatoshi Ishikawa; Akio Mitsui; Masakazu Morigaki, and Takashi Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

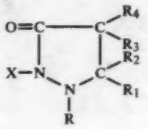
Filed Sep. 21, 1982, Ser. No. 420,665
Claims priority, application Japan, Sep. 21, 1981, 56-149078
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—546 **8 Claims**

1. A multi-layered color photographic sensitive material, comprising:

a support base;

a silver halide emulsion layer; and

a layer containing a high boiling solvent and an oil-soluble coupler, wherein the volume ratio of solvent to coupler is ½ or less, and a compound represented by the general formula (I):



(I)

wherein X is a hydrogen atom or an acetyl group, R is an aryl group, and R_1, R_2, R_3 and R_4, which may be the same or different, each represents a hydrogen atom, an alkyl group or an aryl group.

4,409,325

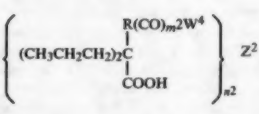
VALPROATE CONJUGATION USING DICARBONYLS

Danton K. Leung, San Jose, and Prithipal Singh, Santa Clara, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 168,867, Jul. 14, 1980, Pat. No. 4,323,507, which is a division of Ser. No. 11,254, Feb. 12, 1979, Pat. No. 4,238,389. This application Dec. 21, 1981, Ser. No. 332,630
Int. Cl.³ G01N *33/54*; C12N *9/96*; A61K *39/00*
U.S. Cl. 435—7 **2 Claims**

1. Method for determining the presence of valproate in a physiological fluid which comprises combining in an aqueous assay medium a sample of said physiological fluid,

antibodies prepared in response to an antigen of the formula:



wherein:

R is an alkylene group of from 1 to 6 carbon atoms;

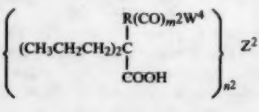
m^2 is 0 or 1;

Z^2 is a poly(amino acid);

n^2 is at least 1 and not greater than the molecular weight of Z^2 divided by 500; and

when m^2 is 0, W^4 is methylene bonded to amino groups of Z^2 and when m^2 is 1, W^4 is a bond to amino groups of Z^2 to form amide linkages,

an enzyme conjugate of the formula:



wherein

R is an alkylene group of from 1 to 6 carbon atoms;

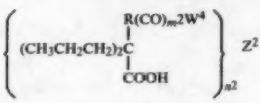
m^2 is 0 or 1;

Z^2 is an NAD dependent enzyme;

n^2 is at least 1 and not greater than the molecular weight of Z^2 divided by 500; and

when m^2 is 0, W^4 is methylene bonded to amino groups of Z^2 and when m^2 is 1, W^4 is a bond to amino groups of Z^2 to form amide linkages, NAD and remaining substrate for said enzyme, and determining the rate of transformation from NAD to NADH as compared to the rate determined with an assay medium having a known amount of valproate.

2. Antibodies prepared in response to an antigen conjugate of the formula:



wherein:

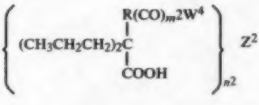
R is an alkylene group of from 1 to 6 carbon atoms;

m^2 is 0 or 1;

Z^2 is a poly(amino acid);

n^2 is at least 1 and not greater than the molecular weight of Z^2 divided by 500; and

when m^2 is 0, W^4 is methylene bonded to amino groups of Z^2 and when m^2 is 1, W^4 is a bond to amino groups of Z^2 to form amide linkages, which antibodies will bind to valproate, antigen conjugate of the above formula, and enzyme conjugate of the formula



wherein:

R is an alkylene group of from 1 to 6 carbon atoms;

m^2 is 0 or 1;

Z^2 is an enzyme;

n^2 is at least 1 and not greater than the molecular weight of Z^2 divided by 500; and

when m^2 is 0, W^4 is methylene bonded to amino groups of Z^2 and when m^2 is 1, W is a bond to amino groups of Z^2 to form amide linkages.

4,409,326

STABILIZED ENZYMATIC SOLUTIONS AND METHOD FOR DETERMINING TOTAL CHOLESTEROL IN HUMAN SERUM

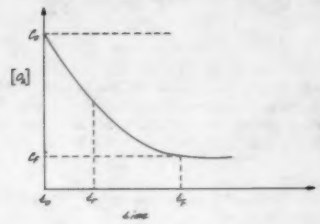
Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010

Continuation of Ser. No. 168,204, Jul. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 68,911, Aug. 23, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,162

Int. Cl.³ C12Q *1/60, 1/26, 1/28;* **C12N** *9/96*

U.S. Cl. 435—11 **27 Claims**

1. An aqueous stabilized enzymic reagent solution for use in determining total cholesterol, comprising cholesterol esterase in an amount greater than 50 U/liter, cholesterol oxidase in an amount greater than 100 U/l, a buffer solution for maintaining the pH within the range of about 4 to 9, a polyhydroxy organic compound in an amount from about 5 to about 50 percent by volume, potassium iodide in an amount from about 1 to about 15 percent by weight, a nonionic surfactant in an amount from



about 0.01 to about 0.5 percent by volume and a salt of cholic acid in an amount from about 0.01 mM to about 10 mM.

4,409,327

PROCESS AND REAGENT FOR THE DETERMINATION OF THE BIOLOGICAL ACTIVITY OF HEPARIN IN PLASMA

Knut Bartl, Wilzhofen; Helmut Lill, Wielenbach; Peter Roeschlau, Seeshaupt, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

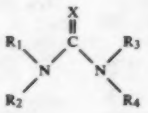
Filed Feb. 11, 1981, Ser. No. 233,536

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1980, 3005540

Int. Cl.³ C12Q *1/56, 1/38*

U.S. Cl. 435—13 **10 Claims**

1. In a method for the determination of the biological activity of heparin in plasma by adding thrombin or factor X_a as a proteolytic enzyme and a chromogen substrate of the latter, and measuring the dye liberated from the chromogen substrate, wherein the determination is carried out in the absence of exogenic anti-thrombin III, the improvement consisting of adding to the reaction mixture 0.02 to 2.0 mole per liter based on the total reaction mixture of at least one compound of the formula



wherein

X is oxygen or the group NR_5; and

R_1, R_2, R_3, R_4 and R_5 are independently selected from hydrogen or alkyl of 1 to 2 carbon atoms, so that the proteolytic enzyme acts in the presence of said compound.

4,409,328

METHOD AND REAGENT FOR THE DETERMINATION OF GLYCEROL

Joachim Ziegenhorn, Starnberg; Knut Bartl, Wilzhofen; Albert Röder, Seeshaupt; Gunter Lang; Hans Möllering, both of Tutzing, and Ulrich Nägele, Bernried, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 16, 1981, Ser. No. 302,861

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035465

Int. Cl.³ C12Q *1/26, 1/28, 1/30, 1/32, 1/44*

U.S. Cl. 435—25 **27 Claims**

1. Method for the determination of glycerol, comprising the steps:

incubating glycerol with galactose oxidase in an aqueous medium in the presence of oxygen for a time and under conditions sufficient for a reaction to occur; and

measuring the oxygen consumed or the products produced in the reaction as a measure of the glycerol.

4,409,329

SACCHARIFICATION METHOD

Richard S. Silver, Monroeville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 243,296, Mar. 24, 1981, abandoned. This application Jul. 15, 1982, Ser. No. 398,618

Int. Cl.³ C12P *19/02, 7/06*

U.S. Cl. 435—105 **10 Claims**

1. A method for the hydrolysis of cellulose to simple sugars which comprises:

contacting in a reaction zone an aqueous slurry comprising from three to 20 weight percent of a solid cellulose containing charge stock with a cellulase enzyme complex wherein the concentration of said enzyme complex is greater than 0.1 units per milliliter of said slurry and wherein said contacting occurs in the presence of a mechanically produced shear rate of from 50,000 to 200,000 feet/minute/foot substantially throughout said reaction zone and wherein the cellulose content of said solid cellulose-containing charge stock is from 30 to 80 weight percent of said charge stock.

4,409,330

MATERIAL AND METHOD FOR REMOVING IMMUNOGLOBULINS FROM WHOLE BLOOD

John K. Pollard, Jr., Del Mar, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 24, 1980, Ser. No. 209,872

Int. Cl.³ C12N *11/10, 11/04*

U.S. Cl. 435—178 **3 Claims**

1. An immunoadsorbent material for removing IgG immunoglobulins and immune complexes from whole blood comprising inactivated, protein A-bearing Staphlococcus aureus bacteria immobilized in a polymeric matrix, said material being in the form of gel like beads having an average diameter ranging from 100 to 1000 microns.

4,409,331

PREPARATION OF SUBSTANCES WITH ENCAPSULATED CELLS

Franklin Lim, Richmond, Va., assignor to Damon Corporation, Needham Heights, Mass.

Continuation-in-part of Ser. No. 243,583, Mar. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 24,600, Mar. 28, 1979, Pat. No. 4,352,883, which is a continuation-in-part of Ser. No. 953,413, Oct. 23, 1978, abandoned. This application Apr. 28, 1982, Ser. No. 372,835

The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

Int. Cl.³ C12N *11/10, 11/04, 5/00, 5/02*

U.S. Cl. 435—178 **25 Claims**

18. A system for producing a substance which is produced by living cells comprising viable cells encapsulated within semipermeable membranes and suspended in an aqueous culture medium for said cells,

the semipermeable membranes of said encapsulated viable cells having an upper limit of permeability sufficient to allow traverse of nutrients required by said cells, said semipermeable membranes comprising a polysaccharide gel having plural anionic groups cross-linked with a polymer having a molecular weight greater than about 3000 and having plural cationic groups, said semipermeable membranes encapsulating suspended viable, healthy, physiologically active cells disposed in a medium which includes all components (A) needed to maintain viability of said cells and which components are of a size in excess of the upper permeability limit of said membranes,

said aqueous culture medium comprising all components (B) needed to maintain viability of said cells having a molecular weight below the upper permeability limit of said membranes.

4,409,332

COLLAGEN-ENZYME CONJUGATES THAT EXHIBIT NO INFLAMMATORY RESPONSE AND METHOD FOR MAKING THE SAME

Steven R. Jefferies, 5802 Leith Walk, Baltimore, Md. 21239; James L. Gutmann, 10112 Daventry Dr., Cockeysville, Md. 21030, and Barry M. Heatfield, 33 Penny La., Baltimore, Md. 21209

Filed Jan. 12, 1982, Ser. No. 338,973

Int. Cl.³ C12N *9/96*

U.S. Cl. 435—188 **11 Claims**

1. An inert, non-inflammatory polymeric conjugate of reconstituted collagen crosslinked to form a matrix and complexed with soluble alkaline phosphatase.

4,409,333

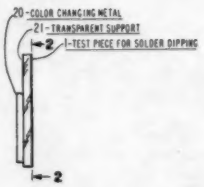
METHOD FOR THE EVALUATION OF SOLDERABILITY

Soitiro Tosima, Machida, and Shigeo Harada, Isehara, both of Japan, assignors to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,595

Int. Cl.³ B23K *1/00*

U.S. Cl. 436—2 **15 Claims**



1. The method for evaluating the solderability properties of a molten solder, said method comprising the steps of

(a) providing a test piece having a transparent support with first and second surfaces, and having a metal film of a predetermined thickness formed on the first surface, said metal of the metal film being a metal which will alloy with the molten solder, said second surface be positioned relative to the first surface so that the area of the metal film on the first surface can be observed through the transparent support from the second surface;

(b) placing the metal film in contact with the molten solder;

(c) maintaining the metal film in contact with the molten solder for a measured length of time, at least sufficiently long enough for noticeable change due to alloying of the molten solder with the metal of the metal film to occur and be observed through the transparent support from second surface;

whereby, a rate of alloying of the molten solder with the predetermined thickness of the metal film is obtained which rate is directly related to the solderability properties of the molten solder.

4,409,334

STABILIZED THROMBIN PREPARATION

Helmut Lill, Wielenbach, and Knut Bartl, Wilzhofen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,364

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019612

Int. Cl.³ G01N *33/48*; C09K *3/00*

U.S. Cl. 436—8 8 Claims

1. Stabilized thrombin preparation comprising thrombin and as a stabilizer serum albumin together with at least one protease inhibitor which does not inhibit thrombin itself and at least one tetraligand or hexaligand chelate former.

4,409,335

METHOD FOR ELIMINATING GLUCOSE DEPENDENT SCHIFF BASE EFFECT FROM HEMOGLOBIN A_1 ASSAY

Mark S. Hanamoto, Mill Valley, and Steve K. Tanaka, Vallejo, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed May 28, 1982, Ser. No. 382,899

The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.

Int. Cl.³ G01N *33/66, 33/72*

U.S. Cl. 436—67 16 Claims

1. In a method for the separation of hemoglobin A_1 from nonglycosylated hemoglobins and the Schiff base precursors to hemoglobin A_1 in a sample of human blood which comprises:

(a) lysing the red blood cells in said sample to form a hemolysate,

(b) impregnating a weak cation exchange resin with said hemolysate,

(c) passing through said resin a buffer solution with ions of an alkali metal dissolved therein at a concentration of from about 0.06 M to about 0.11 M to dissociate said Schiff base precursors into glucose and hemoglobin A and to preferentially elute said glucose and said hemoglobin A_1 over said hemoglobin A said other nonglycosylated hemoglobins, and

(d) recovering the eluate from step (c),

the improvement which comprises including an effective amount of a dihydroxyboryl compound in said hemolysate, said buffer solution, or both.

4,409,336

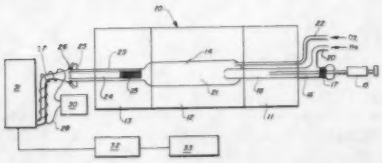
METHOD OF ANALYSIS FOR DETERMINING VERY LOW SULFUR LEVELS IN VOLATILIZABLE SAMPLES

Jack I. Oita, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 234,712, Feb. 17, 1981, abandoned. This application Jun. 7, 1982, Ser. No. 385,795

Int. Cl.³ G01N *31/12, 31/16*

U.S. Cl. 436—123 6 Claims



2. A method of analysis for determining very low levels of sulfur in volatilizable samples which contain sulfur and hydrocarbons which are convertible at least in part to unsatureated hydrocarbons by pyrolysis, which method comprises:

(a) contacting a sample of known quantity with a flowing stream of a carrier gas and oxygen at a temperature in the range of 800° C. to 1000° C. and sufficiently high to pyrolyze and volatilize the sample and to effect the oxidation of oxidizable sulfur containing components therein to sulfur dioxide and sulfur trioxide;

(b) conveying the pyrolyzed and volatilized components of said sample in the flowing stream of carrier gas through a fixed bed of cupric oxide maintained at a temperature in the range of about 650° C. to 800° C., whereby, sulfur dioxide and sulfur trioxide are quantitatively captured by the cupric oxide as copper sulfate and unsaturated hydrocarbons are oxidized so as to be noninterfering in an iodometric analysis;

(c) after all of the sulfur oxides are quantitatively captured, removing the stream of carrier gas together with the oxidized unsaturated hydrocarbons from contact with said fixed bed, and then raising the temperature of the cupric oxide above 840° C. to decompose said copper sulfate and liberate sulfur dioxide; and

(d) determining by iodometric titration the amount of sulfur dioxide which is liberated to determine the sulfur content of said sample.

4,409,337

GLASS ENVELOPES FOR TUNGSTEN-HALOGEN LAMPS

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 12, 1982, Ser. No. 440,865

Int. Cl.³ C03C *3/08*

U.S. Cl. 501—66 4 Claims

3. A glass exhibiting a strain point in excess of 665° C., a liquidus temperature no higher than 1125° C., a viscosity at the liquidus of at least 50,000 poises, and a coefficient of thermal expansion (0°–300° C.) between about $42–46\times10^{-7}$/°C., said glass consisting essentially, expressed in weight percent on the oxide basis, of

SiO_2—54–59
Al_2O_3—15.5–17.5
B_2O_3—3.75–5.5
CaO—6–9.25
MgO—4–6.25
BaO—5–11
ZnO—up to 4

wherein the sum $SiO_2+Al_2O_3$ will not exceed about 75%, the weight ratio SiO_2:Al_2O_3 is maintained about 3.1–3.7, and the weight ratio CaO:MgO is held between about 1.2–2.0.

4,409,338

PROCESS FOR FORMING FAST-COOL VINYL AROMATIC EXPANDABLE POLYMERS

Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1983, Ser. No. 462,156

Int. Cl.³ C08J *9/18*

U.S. Cl. 521—59 10 Claims

1. A process for producing expandable vinyl aromatic polymer particles which exhibit fast-cooling properties in molded products produced therefrom comprising:

polymerizing a vinyl aromatic monomer in which is dissolved about 0.5 to 4.0 percent by weight, based on the vinyl aromatic monomer, of a triblock copolymer rubber of 2–50 weight percent of polymerized vinyl aromatic monomer and 50–98 weight percent of polymerized conjugated diene, to form vinyl aromatic polymer particles containing said triblock copolymer rubber; and impregnating the vinyl aromatic polymer particles, containing said triblock copolymer rubber, with a blowing agent.

4,409,339

HYDROPHILIC SULFONATED POLYOLEFIN POROUS MEMBRANE AND PROCESS FOR PREPARING THE SAME

Kazuo Matsuda; Mitsuo Kohno, both of Yokohama, and Yoshinao Doi, Moriyama, all of Japan, assignors to Asahi Kasei Kogyo, Osaka, Japan

Filed Oct. 6, 1980, Ser. No. 194,341

Claims priority, application Japan, Oct. 16, 1979, 54-132460

Int. Cl.³ C08F *110/00, 8/36;* B01J *47/12*

U.S. Cl. 521—143 **4 Claims**

1. A water permeable porous membrane which consists essentially of a sulfonated polyolefin selected from the group consisting of sulfonated polyethylene, sulfonated polypropylene, sulfonated polybutene and mixtures thereof and sulfonated copolymers of two or more kinds of monomers selected from ethylene, propylene, butene, hexene and tetrafluoroethylene, said polyolefin contains sulfonic groups in an amount, in terms of exchange capacity, of 0.05 to 1 milliequivalent per gram of the sulfonated polyolefin and has a porosity of 30 to 85% and an average pore diameter of 0.05 to 1μ.

4,409,340

HEAT-CURABLE COATING COMPOSITION, ITS USE AND PROCESS FOR COATING SUBSTRATES

Heinrich Stolzenbach; Rudolf Heitzmann, and Siegfried Heinrich, all of Wuppertal, Fed. Rep. of Germany, assignors to Herberts GmbH, Wuppertal, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,061

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108953

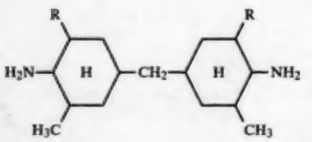
Int. Cl.³ C08G *18/14*

U.S. Cl. 521—159 **19 Claims**

1. Heat-curable coating composition, consisting essentially of

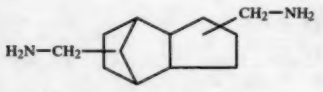
(A) a prepolymer with an average molecular weight of 500 to 15,000, which includes on the average 2 to 6 ketoxime-blocked NCO groups, which are linked via cycloaliphatic and/or aliphatic groups to the prepolymer,

(B) a cross linker from the group of amines having the formula



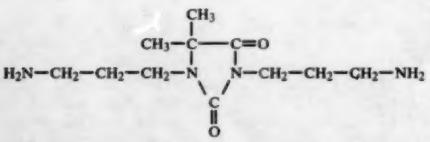
I

in which R represents hydrogen or a methyl group,



II

and



III

(C) organic solvents in an amount of 0 to 50 weight percent based on the total weight of the coating composition,

(D) optionally pigments, fillers, blowing agents and other known additives,

the equivalent ratio of blocked NCO groups of component (A) to NH_2 groups of component (B) lying between 1.3:1 and 0.75:1.

4,409,341

COMPOSITION FOR FIRE RETARDANT URETHANE FOAM

Yasuo Hira, Fujisawa; Susumu Tsuzuku, Tokyo; Makoto Iida, Kawasaki; Masao Gotoh, Yokosuka; Hitoshi Yokono, Katsuta; Yoshikazu Kimura, Seto, and Kazumi Iijima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,323

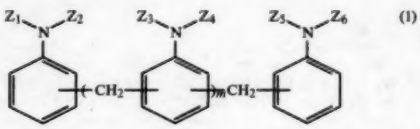
Claims priority, application Japan, Feb. 9, 1981, 56-17002

Int. Cl.³ C08G *18/14, 18/32, 18/77*

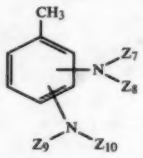
U.S. Cl. 521—162 **8 Claims**

1. In a composition for forming rigid polyurethane foam comprising one or more polyols, one or more isocyanates, one or more catalysts, one or more foam stabilizers, one or more blowing agents and one or more fire retardants, the improvement wherein

(a) the one or more polyols comprises at least one polyol selected from polyols represented by the formulae (1) and (2) in an amount of 30 to 70% by weight of the polyols contained within said composition:

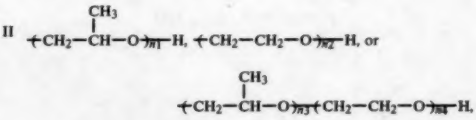


(1)



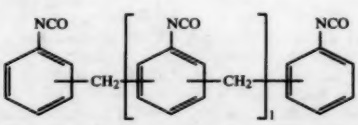
(2)

wherein m is zero or an integer of 1 to 4; Z_1 through Z_{10} are individually



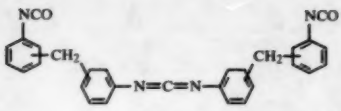
in which n_1 through n_4 are each an integer of 1 to 4;

(b) the one or more isocyanates consist of at least one isocyanate selected from isocyanates represented by the following formulae (3) and (4):



(3)

wherein 1 is 0–1.0,



(4)

the amount of the one or more isocyanates being 0.9 to 1.3 in terms of isocyanate index to the total polyols (a); and

(c) the one or more fire retardant consist of at least one halogen-containing phosphoric ester which is liquid at room temperature under atmospheric pressure; the amount of the one or more fire retardants being at least 0.35% by weight in terms of the content of phosphorus element in the total composition.

4,409,342
SYNERGISTIC REINFORCEMENT PROMOTER SYSTEMS FOR FILLED POLYMERS

Fred H. Ancker, Warren Township, Plainfield County; Arnold C. Ashcraft, Jr., Hightstown, both of N.J.; Eric R. Wagner, deceased, late of Basking Ridge, N.J., and by Maria M. Wagner, executrix, Princeton, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 27, 1981, Ser. No. 295,813
Int. Cl.³ C08K *3/10, 3/34, 3/26*
U.S. Cl. 523—202 **7 Claims**

1. A composition essentially free of free radical initiators comprising a hydrocarbon polymer, an inorganic filler, and about 0.1 to 5.0 weight percent of two interfacial agents wherein:

(a) said agents are capable of copolymerization with each other;

(b) at least one agent contains at least one reactive olefinic double bond capable of mechanico-chemical grafting to the polymer;

(c) one agent is more highly adsorbable onto the filler surface while the other agent is more highly soluble in the filled polymer; and

(d) said agents have a synergy index, S, being greater than zero, which is defined by the formula:

$$S=50(Q_A+Q_S-0.2)(1-10R_f')(0.5-\Delta^2)$$

wherein Q_A and Q_S are the Alfrey-Price resonance parameters of the most reactive olefinic double bonds in the adsorbable and soluble agents, respectively; R_f' is the relative flow ratio of the adsorbable agent measured by thin layer chromatography on a neutral silica gel using xylene as the eluant and di-n-butyl fumarate as the standard, and Δ is the the difference between the Hildebrand solubility parameter of the soluble agent and that of the polymer.

4,409,343
ADHESION OF RUBBER TO GLASS FIBERS

Richard M. Wise, Uniontown, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 331,549, Dec. 17, 1981, Pat. No. 4,355,131, which is a continuation-in-part of Ser. No. 228,844, Jan. 26, 1981, abandoned. This application Jul. 22, 1982, Ser. No. 400,805
Int. Cl.³ C08L *61/10*
U.S. Cl. 523—206 **6 Claims**

1. A glass fiber reinforcing element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition useful for adhering said element to a rubber compound and comprising (a) 100 parts by weight of a rubbery graft copolymer of a seed of (1) a polymer of an acrylate monomer, said polymer having a glass transition temperature of not above about −20° C., said polymer optionally additionally containing copolymerized with said acrylate monomer a very minor amount by weight of a crosslinking polyunsaturated monomer, and a shell of (2) a copolymer of a vinyl pyridine monomer having from 7 to 9 carbon atoms and a conjugated diene monomer having from 4 to 6 carbon atoms, wherein in said graft copolymer the total amount of said monomers forming said graft copolymer is from about 8 to 20% by weight of said acrylate monomer, from 3 to 20% by weight of said vinyl pyridine monomer and from 60 to 89% by weight of said conjugated diene monomer and (b) from about 3 to 15 parts by weight of a water soluble thermosetting phenolic-aldehyde resin.

4,409,344
LOW SHRINK UNSATURATED POLYESTER RESINOUS COMPOSITION

Thomas J. Moulson, and John E. Greenzweig, both of Minneapolis, Minn., assignors to Cargill Incorporated, Minneapolis, Minn.

Continuation-in-part of Ser. No. 138,660, Apr. 9, 1980, Pat. No. 4,298,711. This application Jun. 23, 1981, Ser. No. 276,478
Int. Cl.³ C08K *3/04, 3/08*
U.S. Cl. 523—512 **10 Claims**

1. A molding compound containing fibrous reinforcement comprising:

(a) a low shrink polyester which is a product of a mixture of

(i) from about 25 to about 35 parts by weight of a member selected from the group consisting of maleic acid, fumaric acid, their anhydrides and mixtures thereof;

from about 5 to about 25 parts by weight of a member selected from the group consisting of isophthalic acid, phthalic acid, their anhydrides, and mixtures thereof;

from about 10 to about 40 parts by weight propylene glycol;

from about 10 to about 30 parts by weight dipropylene glycol;

from about 5 to about 30 parts by weight propylene glycol terephthalate;

(ii) heating said mixture of about 420° F. until a neat resin is formed with an acid number of from about 5 to about 50; and

(iii) diluting the neat resin with from about 25 to about 100 parts by weight of a member selected from the group consisting of styrene, vinyl toluene and mixtures thereof;

(b) mixing said resin with a filler, fibrous reinforcing agent and catalyst-initiator.

4,409,345
POLYOLEFIN RESIN COMPOSITION

Tsutomu Moteki, Sodegauramachi; Kazuo Aoki, Chibashi; Kunihiro Yamaguchi, and Michio Yoshizaki, both of Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Dec. 30, 1981, Ser. No. 335,678
Claims priority, application Japan, Jan. 6, 1981, 56-614
Int. Cl.³ C08L *23/04*
U.S. Cl. 524—13 **4 Claims**

1. A polyolefin resin composition comprising:

(a) a resin mixture comprising 50 to 90% by weight of a block copolymer of propylene containing at most 40% by weight of ethylene or butene and 8 to 50% by weight of a high density polyethylene resin, each based on the weight of said resin mixture;

(b) a modified polyolefin resin obtained by graft-polymerizing at least one monomer selected from the group consisting of polymerizable unsaturated carboxylic acids, their salts and their esters; and

(c) finely divided vegetable fibers, the ratio by weight of (a) to (b) being in the range of 55:45 to 99:1, and the content of (c) being in the range of 15 to 70% by weight based on the dry weight of the fibers and based on the weight of the composition.

4,409,346

COMPOSITIONS STABILIZED BY 6-AMINO-DIBENZ[D,G][1,3,2]DIOXAPHOSPHOCINES

Michael Rasberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

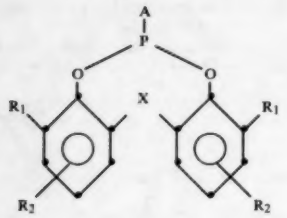
Division of Ser. No. 146,974, May 5, 1980, Pat. No. 4,322,527. This application Dec. 15, 1980, Ser. No. 216,350

Claims priority, application Switzerland, May 15, 1979, 4504/79

Int. Cl.³ C08K *5/46, 5/15, 5/49, 5/51*

U.S. Cl. 524—83 **14 Claims**

1. A composition comprising an organic substrate stabilized by an effective amount of a compound of formula I

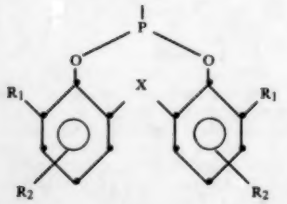


(I)

wherein

R_1 is hydrogen, C_1–C_{18} alkyl, C_5–C_{12} cycloalkyl, phenyl or C_7–C_9 phenylalkyl and R_2 is hydrogen or C_1–C_{18} alkyl, or, if R_1 is hydrogen, R_2 is a divalent 1,1,3,3-tetramethylpropylene radical fused in the 2-position and 3-position or the 9-position and 10-position, and X is a group —CH(R_3)—, in which R_3 is hydrogen or a radical of the formula II —CH(R_4)—CH(R_5)SR_6, and each of R_4 and R_5 independently is hydrogen or C_1–C_6 alkyl and R_6 is C_1–C_{20} alkyl, while the alkyl group can be interrupted by one or more sulfur atoms, and

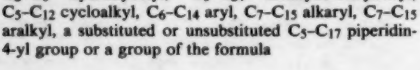
A is a group —N(R_7)R_8 (IV), in which R_7 is hydrogen, C_1–C_{22} alkyl, C_2–C_{21} oxa- or thiaalkyl, C_3–C_{18} alkenyl, C_3–C_{18} alkynyl, C_2–C_6 hydroxyalkyl, C_3–C_{24} alkoxycarbonylalkyl, C_5–C_{12} cycloalkyl, C_6–C_{14} aryl, C_7–C_{15} alkaryl, C_7–C_{15} aralkyl, a substituted or unsubstituted C_5–C_{17} piperidin-4- or -1-yl group or a group of the formula III



(III)

in which

R_1, R_2 and X are as defined above, and R_8 is C_1–C_{22} alkyl, C_2–C_{21} oxa- or thiaalkyl, C_3–C_{18} alkenyl, C_3–C_{18} alkynyl, C_2–C_6 hydroxyalkyl, C_3–C_{24} alkoxycarbonylalkyl, C_5–C_{12} cycloalkyl, C_6–C_{14} aryl, C_7–C_{15} alkaryl, C_7–C_{15} aralkyl, a substituted or unsubstituted C_5–C_{17} piperidin-4-yl group or a group of the formula



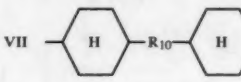
(V)

or

(VI)

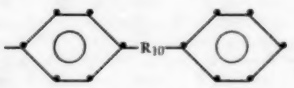
in which

R_7 is as defined above and n is 0 or 1, and R_9 is C_2–C_{22} alkylene which can be interrupted by one or two oxygen or sulfur atoms, or is C_4–C_{22} alkenylene, C_4–C_{22} alkynylene, C_5–C_9 cycloalkylene or a group of the formula



VII

in which R_{10} is —O—, —S— or —(R_{11})C(R_{12})—, in which each of R_{11} and R_{12} independently is hydrogen or C_1–C_8 alkyl, or R_{11} and R_{12} together with the carbon atom to which they are attached form C_5–C_{12} cycloalkyl; and R_9 is also phenylene, biphenylene or a group of the formula VIII



in which

R_{10} is as defined above, and each of r, t and u independently is 2, 3, 4, 5 or 6 and m is 0, 1, 2 or 3, and Q is a group of the formula III, in which R_1, R_2 and X are as defined above, or R_7 and R_8 together with the nitrogen atom to which they are attached are also substituted or unsubstituted pyrrolidine, oxazolidine, piperidine or morpholine, or R_7 and R_8 together form the radical —CH_2—CH_2—N(-Q)—CH_2—CH_2—, in which Q is as defined above.

4,409,347

FLAME-PROOF POLYAMIDE MOULDING COMPOSITIONS

Ludwig Rottmaier, Odenthal; Rudolf Merten, Leverkusen; Milan J. Tima, Cologne, and Dietrich Michael, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

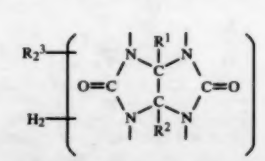
Filed Mar. 8, 1982, Ser. No. 355,602

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109479

Int. Cl.³ C08K *5/34*

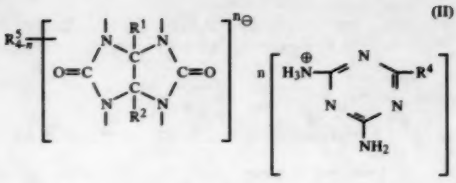
U.S. Cl. 524—91 **9 Claims**

1. A self-extinguishing flame-resistant thermoplastic polyamide moulding composition which optionally contains up to 60% by weight, based on the total composition, of reinforcing material and/or filler and optionally other conventional aids or additives, and which contains from 0.1 to 20% by weight, based on the total composition, of at least one glycoluryl, a reaction product of a glycoluryl or a mixture thereof as flame-proofing agent, said glycoluryl being of the formula



(I)

and said reaction product of glycoluryl being of the formula



(II)

wherein

R^1 and R^2 may be the same or different and each independently represents hydrogen or an aliphatic or aromatic radical;

R^3 represents hydrogen or an aliphatic, cycloaliphatic, araliphatic or aromatic radical;

R^4 represents hydrogen, amino, an aliphatic, cycloaliphatic, araliphatic or aromatic radical or one of said radicals substituted with halogen;

R^5 represents hydrogen or an aliphatic, cycloaliphatic, araliphatic or aromatic radical and

n represents an integer of from 1 to 4.

4,409,348

POLY-BIS-TRIAZINYLAMINOTRIAZINYLAMINES, THEIR PREPARATION AND THEIR USE AS LIGHT STABILIZERS FOR PLASTICS, AND PLASTICS WHICH HAVE BEEN STABILIZED WITH THEM

Hartmut Wiezer, Gersthofen, and Gerhard Pfahler, Augsburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

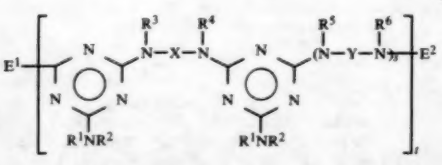
Filed May 3, 1982, Ser. No. 374,085

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3117964

Int. Cl.[3] C07D *43/00;* C08K *5/34;* C08L *79/04*

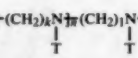
U.S. Cl. 524—100 5 Claims

1. A poly-bis-triazinylaminotriazinylamine of the formula (I)

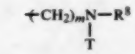


(I)

in which s is 0 or 1, t denotes an integer from 1 to 100 and R^1 and R^2 are identical or different and represent a group of the formula (II) or (III)

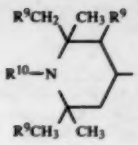


(II)



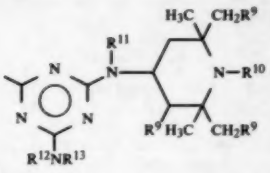
(III)

in which formulae k, l and m denote identical or different integers from 2 to 6 and n denotes an integer from 0 to 3, R^7 and R^8 are identical or different and represent hydrogen, C_1–C_{18} alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 phenylalkyl or a group of the formula (IV)



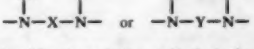
(IV)

in which R^9 is hydrogen or methyl and R^{10} is hydrogen, C_1–C_{12} alkyl which can be substituted by 1 or 2 hydroxyl groups, C_3–C_8 alkenyl or benzyl, and T denotes a radical of the formula (V)



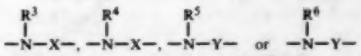
(V)

in which R^9 and R^{10} have the meanings indicated above, R^{11} and R^{12} are identical or different radicals which denote hydrogen, C_1–C_{18} alkyl which can be substituted by hydroxyl, C_1–C_{18} alkoxy or C_1–C_2 alkylamino, or denote C_5–C_{12} cycloalkyl which can be substituted by 1 to 4 C_1–C_4 alkyl groups, or denote allyl, phenyl which can be substituted by up to two C_1–C_8 alkyl groups and/or by an OH group, C_7–C_{14} aralkyl or a group of the formula (IV), and R^{13} denotes hydrogen, C_1–C_{18} alkyl, C_5–C_{12} cycloalkyl, C_7–C_{14} aralkyl or a group of the formula (IV), R^3, R^4, R^5 and R^6 represent identical or different radicals R^{13}, X and Y are identical or different and denote C_2–C_{18} alkylene, C_2–C_{12} bis-(propoxy)-alkylene or monocycloalkylene, dicycloalkylene or tricycloalkylene which has 6 to 18 C atoms and which can be substituted by up to four methyl groups and in which, moreover, up to two C atoms can be replaced by N atoms which can carry propylene groups, or denote C_6–C_{18} arylene or C_7–C_{18} aralkylene, or the groupings



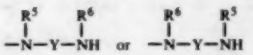
or

can be replaced by piperazinylene radicals, or the groupings



or

can be replaced by C_5–C_9 azamonocycloalkylene or azabicycloalkylene radicals which can be substituted by up to four methyl groups, with the limitation that, if s=zero, X is not C_2–C_6 alkylene or C_2 to C_6 alkylene which is interrupted by 0, and, if s=1, either X alone or Y alone may be C_2–C_6 alkylene or C_2–C_6 alkylene which is interrupted by 0, E^1 represents Cl or a group of the formula $—NR^{14}R^{15}$,



or

in which R^{14} and R^{15} are identical or different and denote R^1 or R^2, and, if t=1, R^{14} can also denote a radical R^{11} or R^{12} and R^{15} can denote a radical R^{13}, and E^2 is H, Cl or $—NR^{14}R^{15}$, and, in formula (I), at least one of the radicals R^1, R^2, R^3, R^4, R^5 and R^6 denotes a group of the formula (IV) or contains this group.

5. Synthetic polymers which have been stabilized against

decomposition by UV light and which contain 0.01 to 5 parts by weight, relative to the polymer, of a compound as claimed in claim 1.

4,409,349

STABILIZED POLYCARBONATE COMPOSITIONS

George E. Ham, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1982, Ser. No. 370,698
Int. Cl.³ C08K 5/15
U.S. Cl. 524—108 6 Claims

1. A heat stabilized aromatic polycarbonate composition resistant to yellowing which comprises an aromatic polycarbonate blended with a heat stabilizing amount of a 2-keto-1,3-dioxolane containing compound having a boiling point greater than about 250° C.

4,409,350

FIRE RETARDANT ACRYLIC FIBERS CONTAINING ORGANO-TIN-SULFUR COMPOUND HAVING HIGH DEGREE OF GLOSSINESS

Kazuaki Fujiwara, Himeji, and Akio Konishi, Kakogawa, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1981, Ser. No. 317,256
Claims priority, application Japan, Nov. 26, 1980, 55/167128
Int. Cl.³ C08K 3/00
U.S. Cl. 524—180 5 Claims

1. Acrylic fiber comprising a copolymer containing 30 to 70% by weight of acrylonitrile and 30 to 70% by weight of at least one halogen-containing monomer, said fiber further containing 0.2 to 3.0% by weight of at least one organic tin compound containing sulfur which is soluble in a solvent in which said copolymer is soluble, and 0.2 to 20% by weight of a glycidyl methacrylate polymer, based on the weight of said copolymer.

4,409,351

COMPOSITIONS COMPRISING THERMOPLASTIC RESIN AND LONG CHAINED FATTY ACID

Garland G. Lee, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jun. 15, 1981, Ser. No. 273,589
Int. Cl.³ C08K 5/09; C08L 69/00, 91/06
U.S. Cl. 524—322 15 Claims

1. A composition comprising a thermoplastic resin selected from the group consisting of aromatic polycarbonate, polysulfone, polyethersulfone, polysulfide or polyacrylate in admixture with an injection mold releasing effective amount of a saturated or unsaturated fatty acid having from about 14 to about 36 carbon atoms, inclusive.

4,409,352

METHOD OF MAKING A DISPERSION LACQUER FOR LUMINESCENT SCREENS

Heinz Beckerle, Aichwald; Lothar Huster, Plochingen, and Rolf Zondler, Stuttgart, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,639
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046373
Int. Cl.³ C08K 3/38
U.S. Cl. 524—405 10 Claims

1. Method of making a dispersion lacquer containing a boric-acid compound and intended for use as a volatilizable substrate layer during the metallization of a luminescent screen, wherein an aqueous emission of a polyacrylate, an inorganic binder, and an oxidizing agent are used, the improvement comprising the steps of:

adding an aqueous solution of a polyvinylalcohol and a boric-acid solution as separate ingredients at approximately room temperature; and

adding a neutralizer to adjust the pH value of the dispersion lacquer to a desired level, whereby a desired viscosity is obtained.

4,409,353

EASILY DISPERSIBLE COMPOSITION FOR WATER SOLUBLE POLYMER

Osamu Umekawa, Kaizuka; Yosuke Ito, Osaka, and Sakae Katayama, Kobe, all of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka, Japan

Filed Jun. 29, 1982, Ser. No. 393,380
Claims priority, application Japan, Jul. 11, 1981, 56-108686
Int. Cl.³ C08K 3/30
U.S. Cl. 524—421 13 Claims

1. An easily dispersible composition having a high degree of granularity and free-fluidity which comprises a powder of a water-soluble polymer having flocculating ability and a hydrated sodium sulfate, and if required a hydrated magnesium sulfate and/or a hydroscopic agent.

4,409,354

FLUORINATED RESIN COATING COMPOSITION CONTAINING MICACEOUS IRON OXIDE

Mutsusuke Namba, Settsu; Seisuke Suzue, Ibaraki; Toshio Mizuno, Takatsuki, and Yoshiaki Kataoka, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00013, § 371 Date Sep. 1, 1981, § 102(e) Date Sep. 1, 1981, PCT Pub. No. WO81/02161, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 21, 1981, Ser. No. 299,026
Int. Cl.³ C08K 3/08; C08L 27/18; B32B 27/20; C09D 3/78
U.S. Cl. 524—431 15 Claims

1. A fluorinated resin coating composition comprising (a) a fluorinated resin, (b) micaceous iron oxide and (c) a liquid carrier.

4,409,355

PROCESS FOR PREPARING HIGH SOLIDS COPOLYMER LATICES WITH LOW VISCOSITY

Manfred Heimberg, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 294,021, Aug. 18, 1981, which is a continuation of Ser. No. 128,603, Mar. 10, 1980, abandoned.
This application Jan. 29, 1982, Ser. No. 344,234
Int. Cl.³ C08L 33/08, 33/10
U.S. Cl. 524—458 14 Claims

1. A process for preparing copolymer latices possessing a solids content of at least about 60 weight percent and a viscosity not exceeding 15,000 cp. Brookfield Viscosity (RVF, Spindle No. 4) at 2 rpm from (a) vinyl acetate in an amount representing from about 10 weight percent to about 95 weight percent of total monomer charge, and (b) at least one monomer selected from the group consisting of acrylate ester, methacrylate ester, and vinyl ester of an alpha-branched saturated monocarboxylic acid representing the balance of the total monomer charge which comprises polymerizing in a single reaction stage at least 10 weight percent of the total vinyl acetate monomer (a) and from 0 to about 50 weight percent of the total acrylate ester, methyacrylate ester and/or vinyl ester of alpha-branched saturated monocarboxylic acid monomer (b) in an aqueous emulsion reaction medium containing a polymerization catalyst, and thereafter polymerizing in said reactor in a second stage the remaining portion of the total vinyl acetate monomer (a) together with the remaining portion of the acrylate ester, methacrylate ester, and/or vinyl ester of alpha-branched saturated carboxylic acid monomer (b) in the reaction medium containing additional catalyst if needed, polymerization being continued substantially to completion.

4,409,356

ORGANOSILICIC ELASTOMERS REINFORCED WITH IMPROVED PRECIPITATED SILICA PARTICULATES

Robert Lagarde, Feyzin, and Georges Vrisakis, Collonges au Mont d'Or, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 19, 1980, Ser. No. 218,291
Claims priority, application France, Dec. 20, 1979, 79 31218
Int. Cl.³ C08K 3/34
U.S. Cl. 524—492 15 Claims

1. A filler reinforced organosilicic polymeric composition of matter, the reinforcing filler therefor comprising a reinforcing amount of precipitated silica particulates having the properties:

(i)	BET surface area	190 to 340 m^2/g
(ii)	CTAB surface area	180 to 280 m^2/g
(iii)	Ratio $\frac{\text{BET surface area}}{\text{CTAB surface area}}$	0.9 to 1.2
(iv)	Residual sodium content	<500 ppm
(v)	pH	3.5 to 6.0
(vi)	Specific volume V_σ	>4.2
(vii)	Amount of particles of a size as will not pass through a 45μ mesh sieve	<0.05%

4,409,357

FOOTWEAR-COMPOUNDS FROM DERIVATIZED STAR-BLOCK COPOLYMERS

Ralph Milkovich, Paoli, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 10, 1981, Ser. No. 300,832
Int. Cl.³ C08L 91/00, 53/02; C08K 3/36, 5/01
U.S. Cl. 524—505 5 Claims

1. A shoe-sole composition having greater processibility and adhesion to shoe uppers than composition made with underivatized copolymers consisting of:

(a) 100 parts by weight of a star-block copolymer of 10 to 55% by weight of a monovinyl aromatic monomer and 45 to 90% by weight of a conjugated diene monomer of 4 to to 8 carbon atoms; said copolymer having at least three arms connected to a polyvinyl aromatic compound nucleus and polar functional groups attached to said nucleus by reacting a derivatization agent directly at the nucleus;

(b) about 80–250 parts by weight of a naphthenic extender oil;

(c) about 40–150 parts by weight of a polystyrene material selected from the group consisting of low molecular weight polystyrene, low molecular weight polyalphamethylstyrene, and mixtures thereof;

(d) about 0–80 parts by weight of a finely divided filler; and

(e) about 0–50 parts by weight of stabilizers.

4,409,358

COPPER COMPLEXES

Helmut Kraft, Wattenheim; Heinz Schumacher, Weinheim; Ernst-Heinrich Pommer; Dietrich Schlotterbeck, both of Limburgerhof, and Gregor Ley, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,800
Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017123; Jun. 14, 1980, 3022432; Oct. 18, 1980, 3039409
Int. Cl.³ C07F 1/08
U.S. Cl. 524—547 6 Claims

1. A copper ammine salt of a polymer or copolymer of acrylic acid or methacrylic acid, wherein the term ammine includes complexes of ammonia and/or low molecular weight volatile amines and wherein the anion is a polymer or copolymer of 60–100% of acrylic acid and/or methacrylic acid and 0–40% of a lower alkyl ester of acrylic acid or a lower alkyl ester of methacrylic acid.

4,409,359

SEALING COMPOUND FOR CAN ENDS

Yusaburo Tanimura, Kawasaki, and Hideo Kumasaka, Yokosuka, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,713
Claims priority, application Japan, Feb. 13, 1981, 56-18966
Int. Cl.³ C08L 7/00, 9/00
U.S. Cl. 524—575 8 Claims

1. A sealing compound for can ends excellent in the adaptability to the lining operation, which comprises an aqueous latex of a styrene-butadiene rubber, a tackifier and a filler, wherein said latex contains styrene-butadiene rubber particles having a number average particle size of from 1600 to 3000 Å, which are stabilized by an emulsifier or a dispersant.

4,409,360

UNSATURATED POLYESTERS CONTAINING DICYCLOPENTADIENE IN THE FORM OF ITS ESTERS AND ETHERS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 23, 1982, Ser. No. 422,323
Int. Cl.³ C08K 5/04
U.S. Cl. 524—804 9 Claims

1. An unsaturated polyester resin having dicylopentadienyl ether functionality and dicyclopentadienyl ester functionality produced by reacting under resin forming conditions

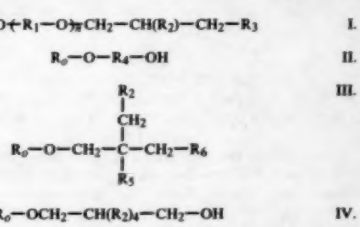
(A) an alpha, beta ethylenically unsaturated polycarboxylic acid, anhydride, or mixture thereof,

(B) about 0.05 to about 1.0 mole dicyclopentadiene, polycyclopentadiene, or a dicyclopentadiene concentrate per mole of (A),

(C) about 0.03 to about 10 moles of water per mole of (A),

(D) a polyol, and

(E) an ether compound having one of the formulas



I.

II.

III.

IV.

where

R_0 = dicyclopentadienyl

n = 0–2

$R_1 = -C_xH_{2x}(-O-C_xH_{2x})_z-$

x = 1–4

z = 0–2

$R_2 = -OH, -O-R_0$

$R_3 = R_2, -O-CH_2-CH(R_2)-CH_2-R_2$

$R_4 = -C_yH_{2y}(-O-C_yH_{2y})_w-$

y = 2–4

w = 0–2

$R_5 = R_2, -CH_2-OH, -CH_2-O-R_0, -CH_3$, or $-H$

$R_6 = -OH, -CH_2-OH, -CH_2-O-R_0, -O-R_0, -(-O-C_yH_{2y})_zOH$; and wherein

R_2, R_3, R_5 and R_6 are chosen so that each compound has at least one hydroxyl group, with the proviso that the combined moles of (D) and (E) are in the range of 0.30 to 2.2 moles per mole of (A).

4,409,361

FIRE RETARDANT POLYMER RESIN

Lawrence E. McAllister, Saco, and Herbert Dietrich, Kennebunk, both of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Continuation-in-part of Ser. No. 232,980, Feb. 9, 1981, abandoned, which is a division of Ser. No. 73,218, Sep. 7, 1979, Pat. No. 4,275,170, which is a continuation-in-part of Ser. No. 58,567, Jul. 18, 1979, abandoned. This application Nov. 4, 1981, Ser. No. 318,141

Int. Cl.³ C08L *61/04*

U.S. Cl. 524—876 8 Claims

1. Method of forming a flame retardant polymer resin, said method comprising the steps of:

mixing an initially non-aqueous substantially unreacted solution of a phenol in a liquid aldehyde in molar ratio of about 0.5 to 1 phenol to aldehyde, said phenol being selected from the group consisting of metacresol, orthocresol, 3,5-dimethylphenol, resorcinol and substituted resorcinols, said aldehyde being selected from the group consisting of furfural and mixtures of furfural and paraformaldehyde;

effecting condensation polymerization of said solution into said resin; and

adding to said solution prior to polymerization, refractory fibers having an aspect ratio of greater than about 10, said fibers being selected from the group consisting of carbon, graphite, silica and metal oxides and silicates.

4,409,362

RESIN-OIL SHALE COMPOSITE REACTION PRODUCT

Joseph A. Bzdula, Fulton, and Howard W. Sibley, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 12, 1982, Ser. No. 377,529

Int. Cl.³ C08F *8/00*

U.S. Cl. 525—54.5 10 Claims

1. A composite reaction product formed from a mixture of oil shale or organics separated therefrom, a resin or resin precursor reactive with said oil shale or organics and a catalyst agent for the reaction between the oil shale or organics separated therefrom and said reactive resin or resin precursor.

4,409,363

PROCESS FOR THE MANUFACTURE OF A MIXTURE OF POLYCARBONATES AND STYRENE-CONTAINING POLYMERS, USE OF THE MIXTURE AND MOLDED PARTS THEREOF

Franz Brandstetter, Neustadt, and Franz Haaf, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,762

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1981, 3106758

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—67 6 Claims

1. A process for the manufacture of a mixture of a polycarbonate and a styrene containing polymer comprises

(a) contacting a dissolved polycarbonate with a precipitating agent and subsequently removing the solvent and the precipitating agent from the precipitated solid material to prepare a polycarbonate having a residual moisture, and

(b) mixing the polycarbonate having the residual moisture and styrene-containing polymer melt at a temperature above the softening range of the polycarbonate and styrene-containing polymer

wherein the polycarbonate having the residual moisture contains more than 1 and less than 50 percent by weight residual moisture, relative to the weight of polycarbonate, and wherein the mixing of the polycarbonate having the residual moisture and the styrene-containing polymer is accomplished while removing volatile ingredients.

4,409,364

ADHESIVE BLENDS AND COMPOSITE STRUCTURES COMPRISING ACID OR ANHYDRIDE MODIFIED PE + HOPE + POLYPROPYLENE

Seymour Schmukler, Palatine; John Machonis, Jr., Schaumburg, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Dec. 4, 1981, Ser. No. 327,278

Int. Cl.³ C08L *51/06, 23/26*

U.S. Cl. 525—74 10 Claims

1. An adhesive blend consisting essentially of

(a) about 0.1–40 parts by weight in said blend of a graft copolymer of about 70–99.999 wt.% of a polyethylene backbone grafted with about 30–0.001 wt.% of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride for a total of 100% and

(b) about 99.9–60 parts by weight of a blending resin mixture of about 25–90 wt.% of a high density polyethylene and about 75–10 wt.% of a polypropylene for a total of 100%.

4,409,365

THERMOPLASTIC RUBBER BLENDS COMPRISING CRYSTALLINE POLYOLEFIN, VULCANIZED MONO-OLEFIN RUBBER AND VULCANIZED NITRILE RUBBER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 22, 1982, Ser. No. 443,355

Int. Cl.³ C08L *9/02, 23/16, 23/26, 53/00*

U.S. Cl. 525—78 14 Claims

1. An elastoplastic composition comprising a mixture of about 10 to 75 parts by weight of (a) an elastoplastic composition comprising a blend of about 15 to 75 parts by weight of crystalline polyolefin resin and, correspondingly, 85 to about 25 parts by weight of vulcanized monoolefin rubber, and, correspondingly, 90 to about 25 parts by weight of (b) an elastoplastic composition comprising a blend of about 25 to 75 parts by weight of crystalline polyolefin resin, and correspondingly, 75 to about 25 parts by weight of vulcanized nitrile rubber.

4,409,366

HOMOGENEOUS BLENDS OF A TRANS-ISOMER OF POLYISOPRENE

Henry Schmelzer, 66 Wingra Ave., Rutherford, N.J. 07070

Continuation of Ser. No. 196,735, Oct. 14, 1980, abandoned, which is a continuation of Ser. No. 107,375, Dec. 26, 1979, abandoned. This application Apr. 19, 1982, Ser. No. 369,615

Int. Cl.³ C08L *7/00, 33/02*

U.S. Cl. 525—221 14 Claims

1. A composition comprising an apparently homogeneous blend of from 10% to 90% by weight of trans-isomer of poly(1,4-isoprene) substantially free of depolymerized polymer, in combination with from 90% to 10% by weight of an ionomer that contains at least one mol percent of an ethylenically unsaturated carboxylic acid having one or two carboxylic acid groups, wherein at least about 10% of the carboxyl groups are neutralized by a metal having an ionic valence of from one to three, inclusive, and up to about 15% by weight of a cis-isomer of natural rubber or synthetic rubber.

4,409,367
PROCESS FOR CROSS-LINKING POLYMERS

Wilhelmus M. Beijleveld, ZM Oist, and Jan D. van Drumpt, ZD Deventer, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

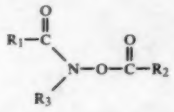
Filed Jan. 8, 1982, Ser. No. 338,172

Claims priority, application Netherlands, Jan. 20, 1981, 8100240

Int. Cl.³ C08F *8/30*

U.S. Cl. 525—277 **7 Claims**

1. In a process for cross-linking a polymer selected from the group consisting of polyethylene and ethylenepropylene copolymers by contacting said polymer with a cross-linking agent at an elevated temperature, the improvement comprising using as the cross-linking agent a compound of the formula



(I)

wherein R_1 and R_2 are independently selected from the group consisting of alkyl groups having 1–22 carbon atoms, alkenyl groups having 2–22 carbon atoms, cyclohexyl groups having 6–20 carbon atoms, phenyl groups having 6–20 carbon atoms, aralkyl groups having 7–20 carbon atoms, alkyloxy groups having 1–22 carbon atoms, alkenyloxy groups having 2–22 carbon atoms, and cyclohexyloxy groups having 6–20 carbon atoms, all of which groups may be substituted or unsubstituted; R_3 is selected from the group consisting of hydrogen, alkyl groups having 1–22 carbon atoms, alkenyl groups having 2–22 carbon atoms, cyclohexyl groups having 6–20 carbon atoms, phenyl groups having 6–20 carbon atoms, aralkyl groups having 7–20 carbon atoms, and

wherein R_4 is independently selected from the same group as R_1 and R_2 as defined above, all of which groups may be substituted or unsubstituted; provided that when R_3 is hydrogen, R_1 represents an alkyloxy, alkenyloxy or cyclohexyloxy group as defined above.

4,409,368
PREPARATION OF STAR POLYMERS

Francis J. Vitus; Ivan G. Hargis, both of Tallmadge; Russell A. Livigni, and Sundar L. Aggarwal, both of Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Jul. 13, 1981, Ser. No. 282,671

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—314 **9 Claims**

1. The method which comprises polymerizing under inert conditions in a hydrocarbon solvent at a temperature of from about 0° to 120° C., or from about 20° to 80° C., a polymerizable ethylenically unsaturated monomer having an activated unsaturated double bond with a hydrocarbon soluble, gel free and stable initiator in a minor amount sufficient to polymerize said monomer to obtain a polymer, said initiator being free of a solubilizing polymerizable comonomer and comprising the adduct of RLi where R is selected from the group consisting of normal, secondary and tertiary alkyl and cycloalkyl radicals of from 2 to 20 carbon atoms, or from 2 to 10 carbon atoms, and a diethylenically unsaturated aromatic compound selected from the group consisting of divinyl benzene and disopropenyl benzene and mixtures thereof, the mole ratio of RLi to said aromatic compound being about 1:0.83, said adduct having an average of from about 4 to 9 C-Li sites and a VPO $\overline{Mn}$ of from about 750 to 4,000 and said polymer having an average of from about 4 to 9 arms and having Li atoms on the ends of said arms.

4,409,369
TRANSPARENT IMPACT RESIN AND PROCESS FOR THE PREPARATION THEREOF

Charles E. Lyons, and Lu H. Tung, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 126,796, Mar. 3, 1980, abandoned. This application May 21, 1981, Ser. No. 265,760

Int. Cl.³ C08L *53/02*

U.S. Cl. 525—314 **21 Claims**

1. A transparent impact resistant alkenyl aromatic resin, the alkenyl aromatic resin being prepared by the free radical polymerization of a monomer, the monomer consisting essentially of an alkenyl aromatic monomer, in the presence of a block copolymer of the AB or $AB(BA)_n$ configuration wherein A represents a block of polymerized alkenyl aromatic monomer and B represents a block of diene polymer and n is an integer of from 1 to 5, the resin having a plurality of diene domains in the form of rods and spheres having diameters less than about 70 nanometers and without observable occlusions of polymerized alkenyl aromatic monomer.

4,409,370
THERMOPLASTIC BLEND OF OXYMETHYLENE COPOLYMERS EXHIBITING IMPROVED IMPACT RESISTANCE

Michael F. Froix, Menlo Park, Calif., and Rajal M. Kusumgar, North Plainfield, N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 165,535, Jul. 3, 1980, abandoned. This application May 26, 1982, Ser. No. 382,215

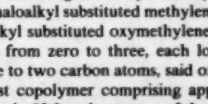
Int. Cl.³ C08L *59/04*

U.S. Cl. 525—414 **10 Claims**

1. A polymer blend having improved impact resistance comprising:

(A) a first copolymer whose recurring units consist essentially of

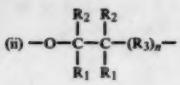
(i) oxymethylene groups having the formula $—OCH_2—$ interspersed with



groups, where each R_1 and R_2 is selected from the group consisting of hydrogen, lower alkyl radicals, and halogen-substituted lower alkyl radicals, each R_3 is selected from the group consisting of methylene, oxymethylene, lower alkyl and haloalkyl substituted methylene, and lower alkyl and haloalkyl substituted oxymethylene radicals, and n is an integer from zero to three, each lower alkyl radical having one to two carbon atoms, said oxymethylene units of said first copolymer comprising approximately 85 to approximately 99.9 mole percent of the recurring units of said first copolymer, said (ii) groups of said first copolymer being incorporated during the step of copolymerization to produce said first copolymer by the opening of the ring of a cyclic ether having adjacent carbon atoms by the breaking of an oxygen-to-carbon linkage, and

(B) a second copolymer whose randomly recurring units consist of

(i) oxymethylene groups having the formula $—OCH_2—$ interspersed with

(ii) 

groups, where R_1, R_2, R_3 and n have the same meanings as the corresponding symbols used with regard to said first copolymer and where the selections made with regard to said second copolymer are independent of the selections made with regard to said first copolymer, said oxymethylene groups of said second copolymer comprising approximately 65 to approximately 75 mole percent of the randomly recurring units of said second copolymer, said (ii) groups of said second polymer comprising approximately 25 to approximately 35 mole percent of the randomly recurring units of the second copolymer and being randomly incorporated during the step of copolymerization to produce said second copolymer by the opening of the ring of a cyclic ether having adjacent carbon atoms by the breaking of an oxygen-to-carbon linkage, wherein said second copolymer comprises approximately 1.5 to approximately 40 weight percent of said blend, said blend having an impact resistance greater than that of said first copolymer.

4,409,371

DICYCLOPENTADIENE MODIFIED POLYESTERAMIDES CONTAINING ENDOMETHYLENETETRAHYDROPHTHALYL FUNCTIONALITY AND PROCESS FOR PREPARING SAME

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 8, 1982, Ser. No. 366,507

Int. Cl.³ C08F *283/00;* **C08G** *63/76;* **C08L** *67/00*

U.S. Cl. 525—418 **18 Claims**

1. A process for preparing dicyclopentadienyl modified polyesteramides containing endomethylenetetrahydrophthalyl groups within the esteramide chain, said process comprising

(1) the reaction of

(a) a dicyclopentadiene or concentrate thereof, water, endomethylenetetrahydrophthalic acid or anhydride and maleic anhydride, maleic acid, fumaric acid or mixture of acid and anhydride, or

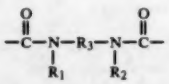
(b) a dicyclopentadiene or concentrate thereof, endomethylenetetrahydrophthalic acid or anhydride, and a polycarboxylic acid, and

(2) adding additional polycarboxylic acid, if desired, and a polyol and a diamine and reacting to substantial completion.

4. A dicyclopentadiene modified polyesteramide composed of:

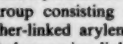
(A) a central esteramide chain containing pendant olefinic unsaturation composed of:

(a) diamido groups of the formula:



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, aliphatic, cycloaliphatic and aromatic or R_1 and R_2 together form a cycloaliphatic ring, and R_3 is a divalent organic radical selected from the group consisting of alkylene, ether-linked alkylene, ether-linked arylene, alkylene amino linked alkylene, alkylene amino linked cycloalylene, cycloalkylene, polycycloalkylene, arylene, bis(alkyl)cycloalkylene and bis(alkyl)polycycloalkylene,

(b) bisalkoxy groups of the formula:



wherein R_3 is a divalent organic radical as before defined,

(c) carboxylic acid groups wherein at least a part of said groups are endomethylenetetrahydrophthalyl and any remaining said groups are α,β-unsaturated, saturated or aromatic or a mixture thereof,

(B) at least one terminal group of said polyesteramide being a dicyclopentadienyl radical.

16. The modified polyesteramide of claim **4** formulated with a reactive diluent.

17. The modified polyesteramide of claim **16** wherein said reactive diluent is styrene.

4,409,372

PAINT BRUSH BRISTLES

John Ward, Crofton, and Robert E. Austin, Crownsville, both of Md., assignors to Ametek, Inc., Odenton, Md.

Filed Jan. 20, 1982, Ser. No. 340,914

Int. Cl.³ D02G *3/00*

U.S. Cl. 525—425 **2 Claims**

1. Paint brush bristles formed of a compatible blend of nylon 6/6 and 4–15% (based on the total quantity of resin) of a copolyester derived from terephthalic and isophthalic acids with cyclohexane dimethanol.

4,409,373

ADHESIVE COMPOSITIONS BASED UPON THERMOPLASTIC POLYAMIDES

Norbert Wiemers, Monheim, Fed. Rep. of Germany, and Italo Albini, Pavia, Italy, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 359,168

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111206

Int. Cl.³ C08L *77/08;* **C09J** *3/16*

U.S. Cl. 525—432 **13 Claims**

1. A hot melt adhesive composition based upon thermoplastic polymerized fatty acid components which comprises:

(I) from about 10 to 90 percent by weight, based on the weight of the total adhesive composition, of a polyamide prepared by condensing:

(a) from about 35 to 49.5 mol percent of dimeric higher fatty acids in combination with

(b) from about 0.5 to 15 mol percent of C_{12}–C_{22}-monomeric fatty acids with

(c) from about 2 to 35 mol percent of polyether diamines of the formula

$$H_2N—R_1—O—(RO)_x—R_2—NH_2$$

wherein x represents a number of from 8 to 80; R_1 and R_2, which may be the same or different, are each a divalent aliphatic or cycloaliphatic hydrocarbon having from 1 to 12 carbon atoms; and R represents a linear or branched aliphatic divalent hydrocarbon radical having from 1 to 6 carbon atoms, and

(d) from about 15 to 48 mol percent of aliphatic or cycloaliphatic diamines having from 2 to 40 carbon atoms in the aliphatic or cycloaliphatic moiety, and

(II) from about 90 to 10 percent by weight, based upon the weight of the total adhesive composition, of a polyamide prepared by condensing:

(a) from about 20 to 49.5 mol percent of dimeric higher fatty acids in combination with

(b) from about 0.5 to 15 mol percent of C_{12}–C_{22}-monomeric fatty acids with

(c) from 55 mol percent of at least one aliphatic or cycloal-

iphatic polyamine having at least 2 primary amino groups and from 2 to 40 carbon atoms.

4,409,374

COLOR DEVELOPER FOR PRESSURE-SENSITIVE COPYING PAPER

Toyoji Kikuga, and Koji Hirai, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Shizuoka, Japan

Continuation of Ser. No. 173,563, Jul. 30, 1980, abandoned, which is a division of Ser. No. 847,518, Nov. 1, 1977, Pat. No. 4,216,299. This application Jan. 25, 1982, Ser. No. 342,538

Claims priority, application Japan, Nov. 4, 1976, 51-131674

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.[3] **C08L** *61/06, 61/10, 61/14*

U.S. Cl. 525—491 **43 Claims**

1. A color developer for pressure-sensitive copying paper which comprises:

(1) a polyvalent metal salt of a para-substituted difunctional phenol-aldehyde condensate, and

(2) a tri- or higher-functional phenol-aldehyde condensate, a polyvalent metal-modified product thereof or a mixture of said condensate and said metal modified product.

4,409,375

METHOD FOR SCAVENGING ALDEHYDES

Seymour Hartman, Mahopac, and Timothy M. Brown, Holmes, both of N.Y., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 11, 1982, Ser. No. 347,965

Int. Cl.[3] **C08G** *12/40*

U.S. Cl. 525—505 **9 Claims**

1. A method for scavenging aldehydes which comprises exposing the aldehydes to alkali metal bisulfite salts as the only scavenging agents.

4,409,376

NOVEL DILUENTS USEFUL IN PREPARING HIGH SOLIDS COATING COMPOSITIONS

Rostyslaw Dowbenko, Gibsonia; Marvis E. Hartman, Pittsburgh, and Thomas R. Hockswender, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 10, 1982, Ser. No. 448,168

Int. Cl.[3] **C08G** *8/28;* **C08L** *61/32*

U.S. Cl. 525—509 **7 Claims**

1. A composition of matter, comprising a reaction product of:

(A) a compound containing from about 1 to 4 ethylenically unsaturated groups, and

(B) a compound having at least two reactive functional groups of varying reactivity; wherein one of said functional groups is a mercapto group which is reactive with the ethylenically unsaturated group or groups of compound (A), and another functional group is a member selected from the group consisting of hydroxyl group, carboxyl group and a group having an oxidizable unsaturation.

6. A coating composition comprising:

(i) the composition of claim 1, and

(ii) a crosslinking agent which is an isocyanate or an aminoplast.

4,409,377

SUSPENSION POLYMERIZATION PROCESS

Yoshiharu Misaka, and Takamitsu Morita, both of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 339,939

Claims priority, application Japan, Jan. 17, 1981, 56-5751

Int. Cl.[3] **C08F** *4/10, 4/26*

U.S. Cl. 526—93 **14 Claims**

1. A suspension polymerization process which comprises suspension polymerizing a mixture of a monovinyl monomer selected from the group consisting of methacrylic acid, acrylic acid or styrene as a major component and a polyvinyl monomer which comprises divinylbenzene as a major component using carboxymethyl cellulose as a dispersing agent, the improvement wherein at least one metal compound selected from the group consisting of a halide, inorganic acid salt, organic acid salt, hydroxide or oxide of iron, zinc and copper is present in the polymerization system in an amount of 0.5 to 10 wt%, calculated as the metal, based on the weight of the carboxymethyl cellulose.

4,409,378

PROCESS FOR POLYMERIZATION OF α-OLEFINS AND CATALYSTS THEREFOR

Tadashi Asanuma, Izumi; Nobutaka Uchikawa, and Tetsunosuke Shiomura, both of Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 268,518, May 29, 1981. This application Mar. 7, 1983, Ser. No. 471,065

Claims priority, application Japan, Jul. 11, 1980, 55/93878

Int. Cl.[3] **C08F** *4/02, 10/06*

U.S. Cl. 526—125 **2 Claims**

1. In a process for the stereospecific polymerization of α-olefins in the presence of a catalytic system comprising a titanium compound supported on a carrier, an organoaluminum compound and an electron donative compound, the improvement which comprises using an activated titanium compound obtained by copulverizing magnesium chloride, an orthocarboxylic acid ester represented by the formula,

$$X^1C(OR^1)_3$$

wherein X^1 is hydrogen or a hydrocarbon group of 1–12 carbon atoms and R^1 is a hydrocarbon group of 1–12 carbon atoms and a 1–10 halogen atom(s)-substituted hydrocarbon having 1–20 carbon atoms and then treating the copulverized product with titanium tetrachloride by suspending the copulverized product in the titanium tetrachloride or a solution thereof as said titanium compound supported on a carrier.

4,409,379

COPOLYMERIZATION PROCESS INITIATED WITH BIS (4-TERT. BUTYL CYCLOHEXYL) PEROXYDICARBONATE AND AEROSOL HAIR LACQUER CONTAINING THE COPOLYMER SO PRODUCED

Quintino Gaetani, Bondy; Bernard Jacquet, Antony; Claude Mahieu, Paris, and Christos Papantoniou, Montmorency, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 83,653, Oct. 11, 1979, abandoned. This application Jul. 29, 1981, Ser. No. 288,157

Claims priority, application France, Oct. 26, 1978, 78 30462

Int. Cl.[3] **C08F** *4/34;* **A61K** *7/11*

U.S. Cl. 526—230.5 **6 Claims**

1. A process for preparing a copolymer useful in cosmetics, in particular, for the production of aerosol hair lacquer compositions, comprising copolymerizing in the presence of bis(4-tert. butyl cyclohexyl)peroxydicarbonate, as the polymerization initiator, 85–95 weight percent vinyl acetate and 5–15 weight percent crotonic acid.

4,409,380

NOVEL TERTIARY ALCOHOL-DIBLOCKED DIISOCYANATE UREA URETHANE OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,793

Int. Cl.³ C08G *18/32, 18/80;* **C08L** *63/00*

U.S. Cl. 528—45 **8 Claims**

1. A chain-extendable crosslinkable tertiary alcohol-diblocked diisocyanate urea urethane oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of primary or secondary alkanolamine of molecular weight about 60 to about 700, with half-blocked diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, whereby both the hydroxy and amine functionality react with free isocyanate groups to form urethane and urea linkages respectively, said oligomer being substantially free of unreacted hydroxy and amino functionality, said half-blocked diisocyanate comprising the reaction product of an alcohol blocking agent bearing a tertiary hydroxyl group, with organic diisocyanate in molar ratio of about 1:1, said oligomer having a de-blocking temperature of about 80° C. to about 220° C.

4,409,381

NOVEL DIBLOCKED DIISOCYANATE UREA URETHANE OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,794

Int. Cl.³ C08G *18/32;* **C08L** *63/00;* **C08G** *18/80*

U.S. Cl. 528—45 **9 Claims**

1. A chain-extendable, crosslinkable diblocked diisocyanate urea urethane oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of primary or secondary alkanolamine of molecular weight about 60 to about 700, with half-blocked diisocyanate of number average molecular weight about 120 to about 2000, in molar ratio of about 1:2, respectively, whereby both the hydroxy and amine functionality react with free isocyanate groups to form urethane and urea linkages respectively, said oligomer being substantially free of unreacted hydroxy and amino functionality wherein said half-blocked diisocyanate is the reaction product of organic diisocyanate with monofunctional blocking agent, wherein said oligomer has a de-blocking temperature of about 120° C. to about 250° C.

4,409,382

SYNTHESIS AND POLYMERIZATION OF PHTHALONITRILE MONOMERS CONTAINING MULTIPLE PHENOXY AND SULFONE LINKAGES

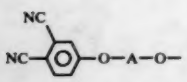
Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 7, 1982, Ser. No. 337,893

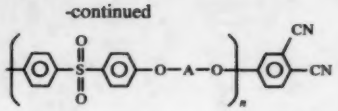
Int. Cl.³ C08G *73/06*

U.S. Cl. 528—173 **57 Claims**

1. An oligomeric polyarylether sulfone phthalonitrile monomer represented by the formula:



-continued



wherein A represents an aromatic unit having from 1 to 3 attached or fused aromatic rings, said rings being attached directly or through an aliphatic group, sulfur, or oxygen; and n represents an average value from 1 to 100.

4,409,383

THERMALLY-RESPONSIVE POLYMERIC MATERIALS

Denis J. Zalucha, Waterford; Frederick H. Sexsmith, Erie, and Dennis D. Howard, Girard, all of Pa.; Michael L. Nulph, Chula Vista, Calif., assignors to Lord Corporation, Erie Pa.

Filed Dec. 2, 1981, Ser. No. 326,628

Int. Cl.³ C08G *18/82, 18/48;* **B32B** *17/06*

U.S. Cl. 528—499 **27 Claims**

1. A polymeric material which is transparent at a first temperature and less transparent at a second temperature, said second temperature being different from and higher than said first temperature, said polymeric material being capable of returning to its more transparent state when its temperature is adjusted to said first temperature, said polymeric material comprising the reaction product obtained by curing in the presence of moisture at least one first organic compound, said first organic compound being selected from the group consisting of linear or branched saturated or unsaturated acyclic, cyclic or aromatic monomeric or polymeric compounds characterized by the presence of at least one reactive isocyanate group, such isocyanate group-containing compound being selected from the group consisting of such compounds which contain at least one hydrophilic center consisting essentially of ethylene oxide units having the structure $(CH_2CH_2O)_n$, wherein n is at least 2, such compounds which do not contain such hydrophilic centers, and mixtures thereof; providing that, when said reactive isocyanate group-containing compound does not contain such hydrophilic centers, said compound is cured in the presence of at least one second compound characterized by the presence of at least one hydrophilic center consisting essentially of ethylene oxide units having the structure $(CH_2CH_2O)_n$, wherein n is as previously defined, said reaction product containing at least 2 percent by weight water.

11. A method for the preparation of polymeric materials which are transparent at a first temperature and less transparent at a second temperature which is different from and higher than said first temperature, said polymeric materials being capable of reverting to the more transparent state when the temperature is adjusted to said first temperature, said method comprising curing in the presence of moisture at least one first organic compound having at least one reactive isocyanate group to form a cured polymeric material, said isocyanate group containing compound being selected from the group consisting of, (1) such compounds having at least one hydrophilic center consisting essentially of ethylene oxide units having the structure $(CH_2CH_2O)_n$, wherein n is at least 2, (2) such compounds which do not contain such hydrophilic centers, and (3) mixtures of such compounds (1) and (2); providing that, when said first compound does not contain such hydrophilic centers, such first compound is cured in the presence of at least one second compound which is characterized by the presence of at least one hydrophilic center consisting essentially of ethylene oxide units as previously defined, and contacting said cured polymeric material with moisture subsequent to its cure in an amount and for a time sufficient for said polymeric material to take up at least two percent by weight of moisture.

4,409,384

VISCOSE PREPARATION USING LOW CONCENTRATION CAUSTIC

William B. Lindsey, Clinton, Iowa, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1981, Ser. No. 320,218
Int. Cl.³ C08G 18/10
U.S. Cl. 536—60 6 Claims

1. A process for the production of viscose having an "F" value greater than 250 from cellulose comprising the steps of:
(i) contacting the cellulose with an aqueous solution containing between 13 and 16 weight percent NaOH for a time and at a temperature sufficient to produce an alkali cellulose with an NaOH content of 12.0 to 15 weight percent and concurrently aging the alkali cellulose by contact with sufficient H_2O_2 and 10–40 ppm of a catalyst selected from the group consisting of Fe, Mn and Co compounds to reduce the DP to between 300 and 800;
(ii) removing excess NaOH from the alkali cellulose;
(iii) xanthating the alkali cellulose; and
(iv) dissolving the cellulose xanthate of step (iii) in aqueous NaOH to form a viscose containing at least 4.0% NaOH.

4,409,385

POLYSACCHARIDES HAVING ANTICARCINOGENIC ACTIVITY AND METHOD FOR PRODUCING SAME

Kazuo Nakajima, Kyoto; Yoshiaki Hirata; Hiroyuki Uchida, both of Otsu; Yoshie Kimizuka; Tsutomu Taniguchi, both of Kyoto; Akira Obayashi, and Osamu Tanabe, both of Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 175,690, Aug. 5, 1980, abandoned. This application Feb. 3, 1981, Ser. No. 231,575
Claims priority, application Japan, Aug. 8, 1979, 54-101100
Int. Cl.³ C07H 1/08; C08B 37/00
U.S. Cl. 536—123 4 Claims

1. A polysaccharide isolated from a liquid extract of at least one of stromatoid and mycelium of a strain of *Isaria atypicola* of the class Hyphomycetes which is capable of producing the polysaccharide, or from a culture medium in which said strain has been incubated, said polysaccharide having anticarcinogenic activity against Sarcoma-180, Ehrlich carcinoma and Meth A, and further having the following characteristics:
(1) white or slight brown powder, non-dialyzable;
(2) Molisch reaction, Anthrone reaction and ninhydrin reaction are positive;
(3) Elson-Morgain reaction is weak positive or negative;
(4) iodide reaction and Bial reaction are negative;
(5) soluble in water and in an aqueous solution of a substance soluble in water, but insoluble in an organic solvent;
(6) no sharp melting point, and is carbonized upon strong heating;
(7) the hydrolyzate of the polysaccharide, obtained by dissolving the polysaccharide in 0.1 N aq. sulfuric acid and heating the solution, containing 0.5% by weight of the polysaccharide, at 100° C. for 5 hours, contains one or more of glucose, galactose and mannose;
(8) elemental analysis is C 35.78%, H 6.28%, N 0.65%.

4,409,386

SEPARATION OF 3,4-DICHLOROANILINE

Tzu-Ching Chang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1982, Ser. No. 405,757
Int. Cl.³ C07C 85/26
U.S. Cl. 564—438 2 Claims

1. A process of purifying crude mixture of 3,4-dichloroaniline containing 2,3-dichloroaniline and 2,5-dichloroaniline as impurities comprising feeding the crude mixture to a multiple stage extraction unit, removing 2,3-dichloroaniline and 2,5-dichloroaniline from the bottom of the multiple stage extraction unit, removing a portion of said 2,3-dichloroaniline and 2,5-dichloroaniline from the system, feeding the remaining 2,3-dichloroaniline and 2,5-dichloroaniline to a neutralizer, feeding from 3.6 to 6.5 percent by weight aqueous hydrochloric acid to the neutralizer to convert, 2,3-dichloroaniline and 2,5-dichloroaniline to their corresponding hydrochlorides, feeding the hydrochlorides to the multiple stage extraction unit, removing an aqueous solution of 3,4-dichloroaniline hydrochloride from the top of the multiple stage extraction unit, reacting the 3,4-dichloroaniline hydrochloride with a base to form an immiscible mixture of an aqueous chloride salt solution and 3,4-dichloroaniline, decanting the mixture to recover 3,4-dichloroaniline, recycling a portion of the 3,4-dichloroaniline to the multiple stage extraction unit.

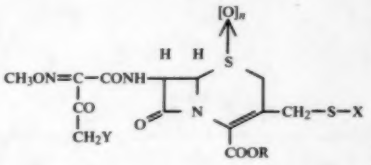
4,409,387

CEPHALOSPORIN DERIVATIVES

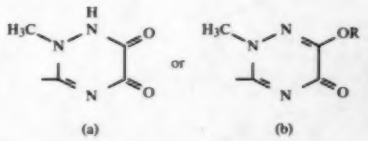
Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 207,163, Nov. 17, 1980, Pat. No. 4,349,672. This application Jun. 30, 1982, Ser. No. 393,995
Int. Cl.³ C07D 501/36
U.S. Cl. 544—26 1 Claim

1. A compound of the formula



wherein X is the group



Y is halogen, R is hydrogen or a readily hydrolysable ester group selected from the group consisting of lower alkanoyloxyalkyl, lower alkoxycarbonyloxyalkyl, lactonyl, lower alkoxymethyl and lower alkanoylaminomethyl groups or a readily hydrolysable ether group selected from the group consisting of lower alkanoyloxyalkyl, lower alkoxycarbonyloxyalkyl, lactonyl, lower alkoxymethyl and lower alkanoylaminomethyl groups and n stands for 1 or 2, as well as pharmaceutically acceptable salts with acids or bases of these compounds.

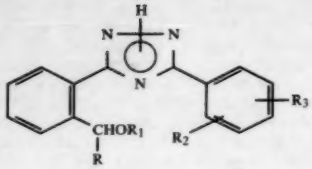
4,409,388

1,2,4-TRIAZOLE DERIVATIVES, AND THEIR USE AS ANTIFERTILITY AGENTS

Amedeo Omodei-Sale', Pavia; Pietro Consonni, and Giulio Galliani, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Oct. 23, 1979, Ser. No. 87,376
Claims priority, application United Kingdom, Oct. 30, 1978, 7842416
Int. Cl.³ C07D 249/08
U.S. Cl. 548—262 3 Claims

1. A 1,2,4-triazole compound having the following general formula



wherein R represents hydrogen or methyl, R_1 represents hydrogen or (C_1–C_4)alkyl or R and R_1 taken together represent a further bond between the carbon and the oxygen atom, R_2 represents (C_1–C_4)alkoxy, chloro, fluoro or bromo and R_3 represents hydrogen or (C_1–C_4)alkyl or R_2 and R_3 taken together represent a methylenedioxy group.

4,409,389

PREPARATION OF IMIDAZOLES

Michael Bellas, Wigan, and John Duvall, Liverpool, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

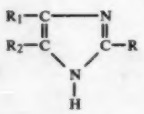
Continuation of Ser. No. 174,056, Jul. 31, 1980, abandoned. This application May 10, 1982, Ser. No. 376,974

Claims priority, application United Kingdom, Jan. 25, 1980, 8002594

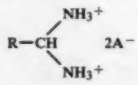
Int. Cl.³ C07D *233/64, 233/58*

U.S. Cl. 548—342 **5 Claims**

1. The process for preparing an imidazole of the formula



comprising contacting a diamine salt of the formula



in concentrated HCl, H_2SO_4, $HClO_4$ or H_3PO_4 with a biscarbonyl compound of the structure

wherein A^- is an anion equivalent of said HCl, H_2SO_4, $HClO_4$, or H_3PO_4, and R, R_1 and R_2 are each selected from hydrogen, an alkyl radical of 1 to 3 carbon atoms, and said alkyl radical substituted with 1 to 3 of halogen, hydroxy, lower alkoxy, lower alkoxycarbonyl, lower alkoxycarbonyloxy, carbamoyl, lower alkylcarbamoyl, lower dialkylcarbamoyl, lower alkylthio, or phenyl.

4,409,390

PYRROLO[3,4-D][2]BENZAZEPINES

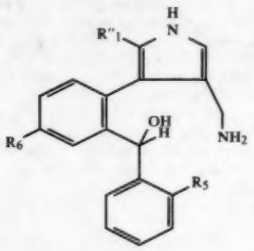
Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 286,124, Jul. 23, 1981, Pat. No. 4,354,973, which is a continuation-in-part of Ser. No. 175,555, Aug. 5, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,935

Int. Cl.³ C07D *207/333, 207/335*

U.S. Cl. 548—561 **1 Claim**

1. A compound of the formula



wherein R_1'' is selected from the group consisting of hydrogen, lower alkyl, C_3 to C_7 alkenyl and C_3 to C_7 alkynyl; R_5 is hydrogen or halogen and R_6 is halogen.

4,409,391

PROCESS TO PRODUCE ANTHRACYCLINE COMPOUNDS

Michael J. Broadhurst, Baldock; Cedric H. Hassall, Welwyn, and Gareth J. Thomas, Luton, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

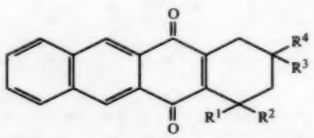
Division of Ser. No. 111,348, Jan. 11, 1980, Pat. No. 4,316,985. This application Nov. 5, 1981, Ser. No. 318,522

Claims priority, application United Kingdom, Jan. 16, 1979, 7901537; Jul. 26, 1979, 7926151

Int. Cl.³ C07C *50/22;* **C07D** *317/72, 339/06*

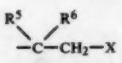
U.S. Cl. 549—39 **5 Claims**

1. A process for the manufacture of compounds of the general formula



I

wherein one of R^1 and R^2 represents a hydrogen atom and the other represents a hydrogen atom or a hydroxy group or R^1 and R^2 together represent an ethylene ketal or ethylene thio ketal group, R^3 represents a hydrogen atom or a hydroxy or lower alkanoyloxy group and R^4 represents a lower alkyl or lower alkoxycarbonyl or benzyloxycarbonyl group or a group of the formula

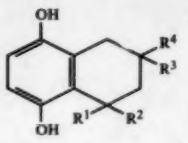


a

wherein R^5 and R^6 together form an oxo group or an ethylene ketal or ethylene thio ketal group and X represents a hydrogen atom or a hydroxy or lower alkanoyloxy group,

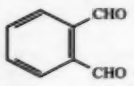
which comprises

reacting a compound of the general formula



III

wherein R^1, R^2, R^3 and R^4 have the significance given earlier in this claim,
with the dialdehyde of the formula



IV

in the presence of an aromatic boronic acid selected from the group consisting of benzeneboronic, tolueneboronic, xyleneboronic, methoxybenzeneboronic, nitrobenzeneboronic and pyridineboronic acid.

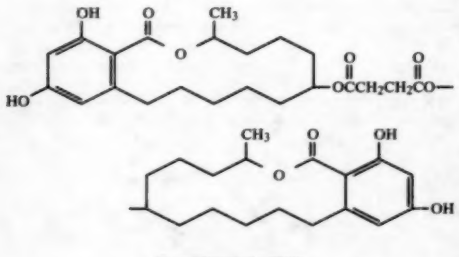
4,409,392

6' ESTERS OF ZEARALANOL

Edward B. Hodge, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Sep. 3, 1981, Ser. No. 299,271
Int. Cl.³ C07D *313/00*
U.S. Cl. 549—270 **1 Claim**

1. The composition



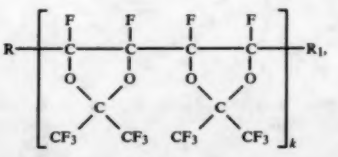
4,409,393

OLIGOMERS OF PERFLUORO(2,2-DIMETHYL-1,3-DIOXOLE) AND THEIR FLUORINATION PRODUCTS

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 2, 1981, Ser. No. 279,867
Int. Cl.³ C07D *317/10*
U.S. Cl. 549—448 **4 Claims**

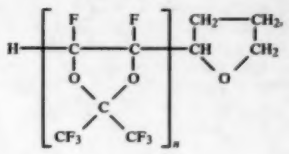
1. An oligomer of perfluoro(2,2-dimethyl-1,3-dioxole) containing at least one chain having the following formula:



(A)

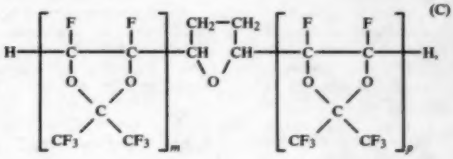
wherein k is 1 to about 4, and each of R and R_1 independently may be hydrogen, a radical obtained by removing a hydrogen atom from an aliphatic or cycloaliphatic ether molecule, a radical corresponding to any free radical, selected from the class consisting of peroxy, peroxycarbonyl, and azo compounds, present in the oligomerization reaction in which the oligomer is produced, the carboxyl group, a carboxylate ion, or a fluorocarbonyl group; with the proviso that when both R and R_1 are hydrogen atoms, the oligomer is a liquid.

2. An oligomer of claim 1 which has a tetrahydrofuran radical attached thereto, either at one of the ends of the oligomer molecule, as shown in formula (B), or at a position removed from the end as shown in formula (C)



(B)

wherein n is about 2–8; and



(C)

wherein each of m and p is about 1–4.

3. An oligomer of claim 2 wherein n in formula (B) is 2–6 and each of (m) and (p) in Formula (C) is at least 2.

4,409,394

SUPPORTED SILVER CATALYSTS MIXED WITH PROMOTER METAL COMPOUNDS FOR THE PRODUCTION OF ETHYLENE OXIDE

Erwin Vangermain; Claus-Dieter Mengler; Rainer Elm; Horst Ueberschaer, and Wilhelm Brauckmann, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 162,649, Jun. 24, 1980, Pat. No. 4,310,442.
This application Sep. 18, 1981, Ser. No. 303,470
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925625
Int. Cl.³ C07D *301/10*
U.S. Cl. 549—534 **8 Claims**

1. In a process for the production of ethylene oxide by the controlled, vapor phase, partial oxidation of ethylene with molecular oxygen in the presence of 7–8 mg of chloride per (stp) m^3 in the circulating gas from using 1,2-dichloroethane and in the presence of a fixed bed supported silver catalyst having a promoter metal compound, the improvement comprising increasing the activity and extending the service life of said catalyst by preparing a physical mixture of particles consisting essentially of:

(a) supported silver catalysts and promoter metal compounds;
(b) supported silver catalysts and supported promoter metal compounds;
(c) promoter metal compound treated supported silver catalysts and promoter metal compounds; or
(d) promoter metal compound treated supported silver catalysts and supported promoter metal compounds; said supported silver catalysts, said promoter metal compounds and said supported promoter metal compounds having the same shape and particle size so that uniform mixing is obtained.

4,409,395

PROCESS FOR THE PRODUCTION OF GLYCOLLIC ACID ESTERS

Haruhiko Miyazaki; Koichi Hirai; Taizo Uda; Yasuo Nakamura, all of Ube; Harumi Ikezawa, Onoda, and Takanori Tsuchie, Ube, all of Japan, assignors to UBE Industries, Ltd., Yanaguchi, Japan

Filed Jan. 18, 1982, Ser. No. 340,033

Claims priority, application Japan, Jan. 26, 1981, 56-9064

Int. Cl.³ C07C 69/66

U.S. Cl. 560—179 10 Claims

1. In a process for producing a glycollic acid ester by the vapor phase catalytic hydrogenation of an oxalic acid diester in the presence of a catalyst and hydrogen gas, the improvement wherein the oxalic acid diester in the vaporous state is contacted with hydrogen gas in the presence of a catalyst composed of Ag supported on a solid carrier at a temperature of from about 120° C. to about 300° C.

4,409,396

PROCESS FOR THE MANUFACTURE OF UNSATURATED CARBOXYLIC ACID ESTERS

Dominik Dempf, Mehring; Ludwig Schmidhammer, Haiming; Gerhard Dummer, Burgkirchen; Günter Roscher, Kelkheim; Karl-Heinz Schmidt, Idstein; Ernst Selbertinger, Marktl, and Rudolf Strasser, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich and Hoechst Aktiengesellschaft, Frankfurt, both of, Fed. Rep. of Germany, a part interest

Filed Sep. 3, 1981, Ser. No. 299,019

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036421

Int. Cl.³ C07C 67/055

U.S. Cl. 560—245 5 Claims

1. In a process for the manufacture of an unsaturated carboxylic acid ester by the reaction of a member selected from the group consisting of an olefin and a cyclo-olefin, with oxygen and a carboxylic acid in the gaseous phase, in the presence of a catalyst selected from the group consisting of a catalyst which contains elements of subsidiary group VIII of the periodic system, a compound which contains elements of subsidiary group VIII of the periodic system and a combination of said catalyst and said compound, and an alkali metal acetate, at temperatures of from 100° to 250° C. and pressures of from 0.5 to 21 bar absolute, the improvement comprising: said reaction being carried out in the presence of from 1 to 8000 parts per million by weight, calculated on the carboxylic acid used, of an organic chlorine compound selected from the group consisting of:

(a) α-chlorocarboxylic acids having from 1 to 4 carbon atoms and esters thereof with alcohols having from 1 to 4 carbons atoms;

(b) α-chloroaldehydes having from 1 to 4 carbon atoms;

(c) chlorine derivatives of methane having from 1 to 4 chlorine atoms;

(d) chlorine derivatives of methane having from 1 to 3 chlorine atoms and at least one fluorine atom;

(e) chlorine derivatives of ethane and of propane each having at least 2 chlorine atoms; and

(f) an admixture thereof.

4,409,397

ASYMMETRIC HYDROGENATION OF TETRA-SUBSTITUTED OLEFINIC ACIDS AND DERIVATIVES

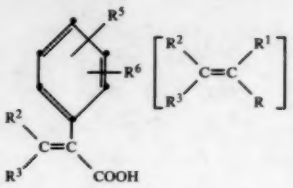
Timm E. Paxson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 6, 1982, Ser. No. 375,437

Int. Cl.³ C07C 59/48, 53/194

U.S. Cl. 562—496 24 Claims

1. A process for the asymmetric hydrogenation of a tetra-substituted olefinic acid, which comprises the hydrogenation of a tetra-substituted olefinic acid having formula I



(I)

wherein R^2 and R^3 each is a methyl group or when taken together with the carbon atom to which they are attached form a cyclopropyl group; R^5 and R^6 each independently is hydrogen, chlorine, fluorine, bromine, or an alkyl or alkoxy group each optionally substituted by one or more halogen atoms in the presence of a coordination complex of rhodium, ruthenium or iridium in combination with a chiral metallocenylphosphine selected from a ferrocenyl-, a ruthenocenyl- or an osmocenylphosphine ligand or pyrrolidinylphosphine ligand.

4,409,398

PREPARATION OF (1R, CIS)-OXYIMINO-SUBSTITUTED CYCLO-PROPANECARBOXYLIC ACIDS

Steven A. Roman, Fulshear, Tex., assignor to Shell Oil Company, Houston, Tex.

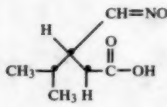
Filed Aug. 13, 1981, Ser. No. 292,567

Int. Cl.³ C07C 131/02

U.S. Cl. 562—506 14 Claims

1. A process for the preparation of (1R,4R,5S)-4-acetoxy-6,6-dimethyl-3-oxabicyclo[3.1.0]hexan-2-one which comprises treating (1R,cis)-4,7,7-trimethyl-3-oxabicyclo[4.1.0]hept-4-en-2-one with ozone and reducing the product formed by this ozonolysis in the presence of hydrogen and a noble metal catalyst of Group VIII.

8. A process for the preparation of a (1R,cis)-oxyimino-substituted cyclopropanecarboxylic acid of the formula



wherein R_1 represents a hydrogen atom; an alkyl group containing from 1 to 10 carbon atoms optionally substituted by one or more halogen atoms; a (cycloalkyl)alkyl group containing from 3 to 7 carbon atoms, a total of from 4 to 9 carbon atoms and optionally ring-substituted by one or more halogen atoms; a cycloalkyl group containing from 3 to 7 ring carbon atoms; an alkenyl group containing from 2 to 4 carbon atoms optionally substituted by one or more halogen atoms; an alkynyl group containing from 2 to 4 carbon atoms; an aryl group containing from 6 to 12 carbon atoms; an aralkyl group containing from 7 to 10 carbon atoms, each optionally ring-substituted by one or more halogen atoms; or a group

wherein X is thienyl, furfuryl, $—CO_2R^1$, $—CONR^1R^2$, $—SO_3R^1$, $—SO_2NR^1R^2$, $—PO(OR^1)_2$, $—NO_2$, —CN, $—OR^1$, $—SR^1$, $—S(O)R^1$, $—S(O)_2R^1$, $—NR^1R^2$, $—N(O)R^1R^2$ or $—(OCH_2CH_2)_q—OR^1$ in which q is an integer of 1 to 4, R^1 and R^2 each independently is a hydrogen atom, an alkyl group containing from 1 to 8 carbon atoms optionally substituted by one or more halogen atoms, a (cycloalkyl)alkyl group contain-

ing from 3 to 7 ring carbon atoms, a total of from 4 to 9 carbon atoms and optionally ring-substituted by one or more halogen atoms, a cycloalkyl group containing from 3 to 7 ring carbon atoms, an alkenyl group containing from 3 to 4 carbon atoms optionally substituted by one or more halogen atoms, an alkynyl group containing from 3 to 4 carbon atoms or an aryl group containing from 6 to 12 carbon atoms or an aralkyl group containing from 7 to 10 carbon atoms, each optionally ring-substituted by one or more halogen atoms, or R^1 and R^2 taken together is an alkylene or oxaalkylene group containing from 4 to 6 carbon atoms, or when one R^1 or R^2 is furfuryl or thienyl then the other is a hydrogen atom; p is an integer of 1 or 2; when p is 1 then X^1 is an alkyl group containing from 1 to 4 carbon atoms or when p is 2 then X^1 is a hydrogen atom, which process comprises treating (1R,cis)-4,7,7-trimethyl-3-oxabicyclo-[4.1.0]hept-4-en-2-one with ozone and then reducing the product formed by this ozonolysis in the presence of hydrogen and a noble metal catalyst of Group VIII, and treating the resulting (1R,4R,5S)-4-acetoxy-6,6-dimethyl-3-oxabicyclo[3.1.0]-hexan-2-one with an acid addition salt of the corresponding hydroxylamine or optionally substituted hydrocarbyloxyamine in the presence of a base.

4,409,399

PROCESS FOR PRODUCING ALIPHATIC AMINES

Harold E. Swift, Gibsonia; Robert A. Innes, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,639

Int. Cl.³ C07C *85/06, 85/08*

U.S. Cl. 564—473 **39 Claims**

1. A process for producing amines which comprises reacting an aliphatic alcohol or an aliphatic aldehyde with an aminating agent selected from the group consisting of ammonia, a primary amine and a secondary amine in the liquid phase in the presence of an unsupported catalyst consisting essentially of (1) copper oxide or copper hydroxide and (2) nickel oxide or nickel hydroxide.

4,409,400

PROCESS FOR THE PREPARATION OF CYCLOHEXANE-1,3-DIONE FROM δ-KETOHEXANOIC ACID ESTER

Werner H. Müller, Eppstein; Karl E. Mack, Kelkheim, and Hansjörg Hey, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

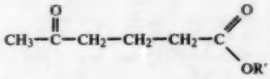
Continuation of Ser. No. 46,098, Jun. 6, 1979, abandoned. This application Apr. 21, 1982, Ser. No. 370,393

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825170

Int. Cl.³ C07C *45/54*

U.S. Cl. 568—346 **6 Claims**

1. A process for the preparation of cyclohexane-1,3-dione consisting essentially of reacting, in the gaseous phase, a δ-ketohexanoic acid ester of the formula



wherein R′ is an alkyl having 1 to 4 carbon atoms at a temperature of from 250° C. to 500° C. in the presence of an impregnated catalyst consisting essentially of a catalytic carrier impregnated with a compound of an active component selected from the group consisting of lanthanum, zirconium, cerium and thorium.

4,409,401

SELECTIVE HYDROGENATION OF ORGANIC MATERIALS

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1981, Ser. No. 293,068

Int. Cl.³ C07C *45/00*

U.S. Cl. 568—362 **12 Claims**

1. A process for selectively hydrogenating one or more unsaturated compounds comprising contacting them with a catalyst containing palladium, sodium carbonate, and thioanisole wherein the sulfur content of the final catalyst is 0.001 to 1 wt. %, based on the total catalyst weight.

4,409,402

TERT.-BUTOXYBUTANALS, TERT.-BUTOXYBUTANOLS, BIS-TERT.-BUTOXYPENTANALS AND BIS-TERT.-BUTOXYPENTANOLS

Walter Himmele, Walldorf, and Werner Hoffmann, Neubofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

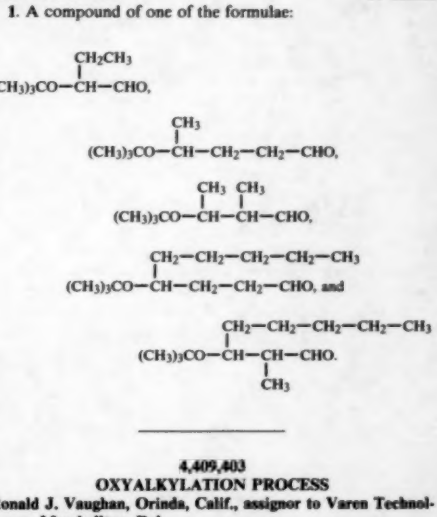
Filed Jul. 11, 1980, Ser. No. 167,790

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932527

Int. Cl.³ C07C *47/02, 43/13, 00/00*

U.S. Cl. 568—496 **10 Claims**

1. A compound of one of the formulae:



4,409,403

OXYALKYLATION PROCESS

Ronald J. Vaughan, Orinda, Calif., assignor to Varen Technology, Marshallton, Del.

Continuation-in-part of Ser. No. 179,520, Aug. 19, 1980, Ser. No. 90,940, Nov. 5, 1979, abandoned, and Ser. No. 660,634, Feb. 23, 1976, Pat. No. 4,317,949, said Ser. No. 179,520, is a continuation-in-part of Ser. No. 65,613, Aug. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 904,502, May 10, 1978, abandoned, said Ser. No. 90,940, is a continuation-in-part of Ser. No. 660,634, , and Ser. No. 65,613,. This application Sep. 28, 1981, Ser. No. 306,482

Int. Cl.³ C07C *41/03*

U.S. Cl. 568—678 **5 Claims**

1. In a process for the oxyalkylation of a vaporizable hydroxylic compound with an alkylene oxide, said reaction being carried out with an excess of said hydroxylic compound and wherein the reaction products are higher boiling than said reactants, the improvement which comprises

(1) vaporizing said hydroxylic compound in a reflux zone,

(2) passing said vaporized hydroxylic compound through a

catalyst zone to a condensing zone whereby said vapor is condensed,

(3) returning said condensed hydroxylic compound to said catalyst zone,

(4) in said catalyst zone contacting said condensed hydroxylic compound with vaporized hydroxylic compound and an alkylene oxide in the presence of a solid insoluble acid catalyst at about the boiling temperature of the liquid phase containing said hydroxylic compound whereby a mono-oxyalkylated derivative of said hydroxylic compound is formed,

(5) returning said mono-oxyalkylated derivative and unreacted hydroxylic compound to said reflux zone, and

(6) recovering said mono-oxyalkylated derivative from said reflux zone.

4,409,404

PROCESS FOR PRODUCING ETHANOL USING SAID NOVEL CATALYST SYSTEM

Wayne R. Pretzer; Thaddeus P. Kobylinski, both of Gibsonia, and John E. Bozik, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

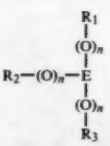
Continuation-in-part of Ser. No. 220,427, Dec. 29, 1980, Pat. No. 4,346,020, which is a continuation-in-part of Ser. No. 42,563, May 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,258, Sep. 5, 1978, abandoned. This application Feb. 26, 1982, Ser. No. 352,807

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.[3] **C07C** *29/00, 27/00*

U.S. Cl. 568—902 **32 Claims**

1. A process for selectively producing ethanol which comprises introducing into a reaction zone (1) methanol, (2) hydrogen, (3) carbon monoxide, (4) a cobalt entity selected from the group consisting of a cobalt carbonyl, a hydrido cobalt carbonyl and a cobalt-containing material convertible to a cobalt carbonyl or a hydrido cobalt carbonyl, (5) a tertiary organo Group VA compound of the Periodic Table of the formula:



wherein E is a member selected from the group consisting of trivalent phosphorus, trivalent arsenic and trivalent antimony; and R_1, R_2 and R_3 are either alike or different members selected from the group consisting of saturated or unsaturated, straight- or branched-chain alkyl radicals having from one to 24 carbon atoms; aryl radicals having from six to 20 carbon atoms; alkenyl radicals having from two to 30 carbon atoms; cycloalkyl radicals having from three to 40 carbon atoms; aralkyl and alkaryl radicals having from six to 40 carbon atoms; and n is an integer of 0 or 1 with the provision that when n is 1, E must be phosphorus

(6) an iodine compound, and (7) a ruthenium compound, wherein the molar ratio of hydrogen to carbon monoxide are in excess of about 1:1, and then subjecting the contents of said reaction zone to an elevated temperature and elevated pressure for a time sufficient to convert methanol to ethanol.

4,409,405

PRODUCTION OF ETHANOL FROM METHANOL AND SYNTHESIS GAS

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 13, 1982, Ser. No. 377,724

Int. Cl.[3] **C07C** *29/00*

U.S. Cl. 568—902 **18 Claims**

1. A process for preparing ethanol which comprises contacting a mixture of carbon monoxide, hydrogen and methanol with a catalyst system comprising a cobalt-containing compound and a germanium-containing compound in the presence of an inert oxygenated hydrocarbon solvent and at a pressure of 500 psi or greater and at a temperature of about 50° to about 350° C.

4,409,406

PROCESS FOR RECOVERING ETHANOL FROM DILUTE AQUEOUS SOLUTIONS EMPLOYING LIQUID EXTRACTION MEDIA

Julian Feldman, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 305,884, Sep. 28, 1981, Pat. No. 4,346,241. This application May 27, 1982, Ser. No. 382,544

Int. Cl.[3] **C07C** *29/76, 29/80, 29/82, 29/86*

U.S. Cl. 568—916 **17 Claims**

1. A process for obtaining substantially anhydrous ethanol from a dilute aqueous ethanol solution thereof which comprises

(a) contacting the dilute aqueous ethanol solution with an inert organic extractant which is liquid at ambient pressure and temperature in at least one extraction zone for a period of time sufficient to provide a raffinate phase containing significantly less ethanol than the dilute aqueous ethanol feed, and an extract phase containing a significant amount of the ethanol originally present in the dilute aqueous ethanol feed,

(b) concentrating the extract phase resulting from step (a) in a rectifying column to provide an aqueous ethanol of high proof; and,

(c) azeotropically distilling the concentrated ethanol resulting from step (b) in an anhydrous column operated under substantially superatmospheric pressure with thermal values recovered from the anhydrous column overheads being used to satisfy part of all of the thermal operating requirements of the rectifying column.

4,409,407

PROCESS FOR THE PREPARATION OF 1,3,5-TRICHLOROBENZENE

Gerd-Michael Petruck, Erkrath, Fed. Rep. of Germany, and Paul R. Wambach, deceased, late of Leverkusen, Fed. Rep. of Germany by Christa Wambach, heiress, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,347

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134726

Int. Cl.[3] **C07C** *17/24*

U.S. Cl. 570—202 **8 Claims**

1. In a process for the preparation of 1,3,5-trichlorobenzene by isomerization of at least one other trichlorobenzene at an elevated temperature in the presence of aluminum trichloride, the improvement wherein the isomerization is carried out in the presence of formic acid.

4,409,408

INHIBITING POLYMERIZATION OF VINYL AROMATIC MONOMERS

Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 24, 1982, Ser. No. 423,409
Int. Cl.³ C07C 7/18
U.S. Cl. 585—4 9 Claims

1. A composition comprised of (a) a vinyl aromatic compound containing an amount effective to inhibit polymerization of said vinyl aromatic compound of a mixture of (1) about 10 to 90 parts by weight of at least one N,N-dialkylhydroxylamine wherein the alkyl groups are the same or different and each alkyl group has 2 to 10 carbon atoms, and (2) about 90 to 10 parts by weight of at least one tertiary-alkylcatechol having 4 to 20 carbon atoms.

5. In a method of inhibiting polymerization of a vinyl aromatic compound comprising adding to the vinyl aromatic compound an amount of an polymerization inhibiting agent effective to substantially reduce the rate of polymerization, the improvement comprising using as the agent a combination of:

(a) about 10 to 90 parts of at least one N,N-dialkylhydroxylamine wherein the alkyl groups are the same or different and each alkyl group has 2 to 10 carbon atoms, and

(b) about 90 to 10 parts of at least one tertiary alkylcatechol having 4 to 20 alkyl carbon atoms

per 100 total parts by weight of the compounds in 8a) and (b).

4,409,409

TWO STAGE OLEFIN WAX PROCESS

Arthur W. Langer, Jr., Watchung; Gerald Doyle, White House Station; Terry J. Burkhardt, Cranford, all of N.J., and Ralph W. Looney, Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 10, 1982, Ser. No. 386,927
Int. Cl.³ C07C 2/74
U.S. Cl. 585—255 5 Claims

1. A process for preparing linear waxes having an M_n of about 500 to about 5000 which comprises the steps of:

(a) oligomerizing ethylene to an ologomerization product having an M_n of about 200 to 700;

(b) metathesizing said oligomerization product to form a linear olefin wax; and

(c) removing from said linear olefin wax essentially all products having a carbon number of less than about C_{30}.

4,409,410

PROCESS FOR SELECTIVELY HYDROGENATING A DI-OLEFIN IN A MIXTURE OF HYDROCARBONS HAVING AT LEAST 4 CARBON ATOMS AND COMPRISING AN α-OLEFIN

Jean Cosyns, Maule, and Daniel Durand, Rueil Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 9, 1982, Ser. No. 347,127
Int. Cl.³ C07C 5/06, 5/16
U.S. Cl. 585—259 10 Claims

1. In a process for selectively hydrogenating a diolefin present in a mixture of hydrocarbons having at least 4 carbon atoms and comprising an 1-olefin in addition to the diolefin, wherein said mixture is reacted with hydrogen in contact with a catalyst, the improvement wherein said catalyst is a supported catalyst comprising simultaneously palladium or a palladium compound and silver or a silver compound, the palladium content of the catalyst being from 0.05 to 0.5% by weight and the silver content from 0.05 to 1% by weight, the

$$\frac{\text{silver}}{\text{palladium}} \text{ ratio}$$

being from 0.7:1 to 3:1 by weight, thereby avoiding substantial isomerization and hydrogenation of the 1-olefin.

4,409,411

PROCESS OF HYDROGENATING BENZENES AND GROUP IVA METAL HYDRIDE CATALYSTS THEREFOR

Guido P. Pez, Boonton, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 17, 1981, Ser. No. 303,261
Int. Cl.³ C07C 5/02, 5/03
U.S. Cl. 585—275 12 Claims

1. A process of producing cyclohexene or alkylcyclohexene which comprises reacting liquid benzene or alkylbenzene with hydrogen gas in the presence of a catalytic amount of a solid carbonaceous group IVa metal hydride.

said solid carbonaceous group IVa metal hydride having been produced by reacting a group IVa metal halide with a hydrocarbon solution of an alkyllithium or aryllithium at a temperature between about 0° and about 120° C., recovering the solid carbonaceous product, and reacting the solid carbonaceous product with hydrogen to produce said solid carbonaceous Group IVa metal hydride.

4,409,412

PROCESS FOR PRODUCING ALKYL AROMATIC COMPOUNDS

Werner O. Haag, and Tracy J. Huang, both of Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 230,176, Jan. 30, 1981. This application Sep. 24, 1982, Ser. No. 423,337
Int. Cl.³ C07C 2/86
U.S. Cl. 585—454 6 Claims

1. A process for alkylating an aromatic compound to provide a product aromatic compound possessing at least one more alkyl group of at least two carbon atoms than the starting aromatic compound, which comprises reacting at elevated temperature at least one aromatic compound possessing at least one hydrogen atom directly bonded to the aromatic nucleus with an alkylating agent which is a mixture of hydrogen and/or a hydrogen-containing substance which provides hydrogen under process conditions and a carbon oxide, in the presence of a catalyst comprising a metal or metal-containing component, selected from the group consisting of iron, cobalt, ruthenium, manganese, rhodium and osmium, and a zeolite having a constraint index of 12 or less whereby said product aromatic compound is produced.

4,409,413

CONVERSION OF XYLENES CONTAINING ETHYL BENZENE

Kazuyoshi Iwayama, Kamakura, and Takehisa Inoue, Tokyo, both of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,318
Claims priority, application Japan, Jun. 23, 1980, 55-83952; Oct. 9, 1980, 55-140408
Int. Cl.³ C07C 5/22, 4/12
U.S. Cl. 585—481 6 Claims

1. A process for simultaneously isomerizing xylenes and hydrodealkylating ethyl benzene to benzene by contacting a mixture containing ethyl benzene and at least one xylene isomer with a catalyst in the presence of hydrogen, said catalyst comprising a mordenite type zeolite which has been ion-exchanged with hydrogen ion and/or hydrogen ion precursor rhenium and phosphorus.

4. A process for simultaneously isomerizing xylenes and hydrodealkylating ethyl benzene to benzene by contacting a mixture containing ethyl benzene and at least one xylene isomer with a catalyst in the presence of hydrogen, said catalyst comprising a mordenite type zeolite which has been ion-exchanged with hydrogen ion and/or hydrogen ion precursor, phosphorus and vanadium.

4,409,414

PREPARATION OF LINEAR OLEFIN PRODUCTS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 10,527, Feb. 9, 1979, abandoned, which is a division of Ser. No. 882,946, Mar. 2, 1978, which is a continuation of Ser. No. 232,618, Mar. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 783,699, Dec. 13, 1968, Pat. No. 4,108,744, which is a continuation-in-part of Ser. No. 562,089, Jul. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 428,836, Jan. 28, 1965, abandoned, which is a continuation-in-part of Ser. No. 55,845, Sep. 8, 1960, Pat. No. 3,168,588. This application Aug. 20, 1980, Ser. No. 179,655

The portion of the term of this patent subsequent to Apr. 29, 1986, has been disclaimed.

Int. Cl.[3] C07C *2/34*

U.S. Cl. 585—524 1 Claim

1. A process for preparing a reaction product comprising at least 90 mole % linear alpha olefins having a number average molecular weight ranging from about 70 to about 700 which comprises polymerizing an ethylene-containing gas in the presence of a substantially soluble catalyst comprising the reaction product of a Ti metal compound with an aluminum alkyl compound such that the ultimate formula of the aluminum alkyl compound is AlR_nX_{3-n}, wherein X is selected from the group comprising chloride, bromide and iodine, n is less than 2, and R is a hydrocarbyl radical, said Ti metal compound having the formula TiX_aA_b, wherein a=3 or 4, b=0 or 1 and a+b=3 or 4, X=Cl or Br and A is Cl or Br or an anion derived from a protonic compound selected from the group consisting of R'OH and R'COOH, wherein R' is selected from the group consisting of alkyl, aryl, aralkyl and cycloalkyl groups, said aluminum alkyl compound and said Ti metal compound being in the presence of a diluent at a temperature of less than about +75° C. and an ethylene pressure above about 50 psia, wherein the mole ratio of ethylene to olefin reaction product is above 0.8 throughout the reaction wherein the product olefin concentration is greater than 5 wt. % based on the diluent and reaction product.

4,409,415

OLEFIN OLIGOMERIZATION USING BORON TRIFLUORIDE AND AN ALCOHOL-POLYOL COCATALYST

Neal E. Morganson, McCandless Township, Allegheny County, and Adam V. Vayda, Oakmont Borough, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sep. 18, 1981, Ser. No. 303,369

Int. Cl.[3] C07C *3/02, 3/18*

U.S. Cl. 585—525 8 Claims

1. A process for producing a mixture of olefin oligomers which comprises contacting in the liquid phase an olefin having from about six to about 20 carbon atoms or a mixture thereof with a catalyst comprising boron trifluoride and a cocatalyst comprising between about 75 and about 99 weight percent of an aliphatic alcohol having from one to about ten carbon atoms, and between about one and about 25 percent of a polyol selected from ethylene glycol, propylene glycol, butane diol and glycerine.

4,409,416

LIGNIN CRACKING PROCESS USING FAST FLUIDIZED BED REACTIONS

George J. Snell, 112 Arlington Dr., Fords, N.J. 08863, and Derk T. A. Huibers, 37 Abey Dr., Pennington, N.J. 08534

Filed Mar. 1, 1982, Ser. No. 353,314

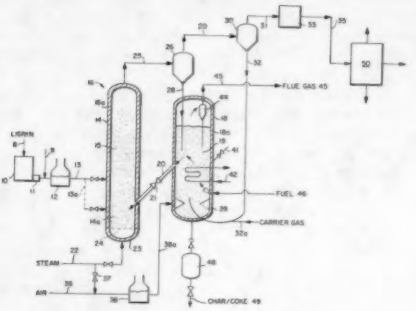
Int. Cl.[3] C07C *1/00, 1/20*

U.S. Cl. 585—635 12 Claims

1. A process for cracking lignin-containing materials to produce hydrocarbon products, comprising:

(a) feeding lignin-containing feed material with a diluent gas into a cracking zone containing a fast fluidized bed of particulate solids carrier material, and maintaining the bed within a temperature range of about 1200°–1700° F. and at an average residence time less than about 5.0 seconds to crack the feed material and produce a crackate material and coke, while depositing coke on the particulate solids carrier material;

(b) passing the crackate effluent from said cracking zone along with said particulate solids carrier material containing coke to a solids separation step, and then passing the solids to a combustion zone containing a slow fluidized bed of said particulate solids carrier material containing



coke maintained at higher temperature then in said cracking zone;

(c) introducing oxygen-containing gas and steam into the slow fluidized bed to maintain it within a temperature range of about 1400°–2000° F. for combustion of coke;

(d) recycling said particulate solids carrier material from said combustion zone to the lower end of said fast fluidized bed cracking zone at a controlled rate to provide process heat therein; and

(e) withdrawing a hydrocarbon vapor effluent product from the solids separation step.

4,409,417

PROCESS OF DEHYDROGENATION OF HYDROCARBONS

Sheldon Herbstman, Spring Valley, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,477

Int. Cl.[3] C07C *5/36*

U.S. Cl. 585—660 16 Claims

1. The method of dehydrogenating a dehydrogenatable hydrocarbon which comprises passing, at dehydrogenating conditions, into contact with a supported dehydrogenation catalyst containing (i) a noble Group VIII metal, (ii) a metal of Group VII B or Group IV A, and (iii) a metal of Group IA, a charge composition containing dehydrogenatable hydrocarbon, hydrogen, and ammonia thereby forming a product dehydrogenated gas stream; and

recovering said product dehydrogenated gas stream.

4,409,418

ISOMERIZATION PROCESS

Marvin M. Johnson; Gerhard P. Nowack, and Semyon Kukes, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1982, Ser. No. 395,939

Int. Cl.[3] C07C *5/24, 5/30*

U.S. Cl. 585—667 6 Claims

1. A process for the isomerization of an aliphatic mono-olefin hydrocarbon feed to shift an internal double bond therein to produce a corresponding terminal olefin which comprises subjecting said mono-olefin hydrocarbon feed under isomeri-

zation conditions to the action of a catalyst comprising zirconium phosphate and at least one of chromium and thorium.

4,409,419

PROCESS FOR PREPARING 2,5-DIMETHYL-2,4-HEXADIENE

Aldo Prevedello; Edoardo Platone, and Morello Morelli, all of San Donato Milanese, Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Aug. 6, 1981, Ser. No. 290,655

Claims priority, application Italy, Aug. 29, 1980, 24353 A/80

Int. Cl.³ C07C *1/20, 1/253*

U.S. Cl. 585—611 **7 Claims**

1. A process for the preparation of 2,5-dimethyl-2,4-hexadiene comprising the steps of contacting 2,5-dimethyl-2,5-hexanediol in liquid phase or in aqueous solutions thereof with an acid, derivatives of said acid or substances which form free acids, heating the mixture thus obtained to a temperature in a range of from about 100° C. to about 160° C., distilling off water as it is formed, recycling the organic phase, and separating the 2,5-dimethyl-2,4-hexadiene obtained from the reaction mixture.

4,409,420

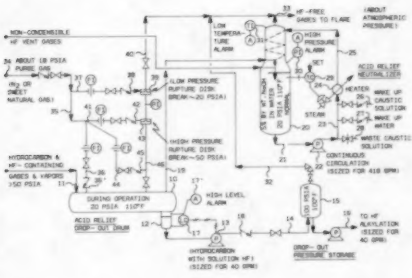
RELIEF SYSTEM

Joe Van Pool, and Mack F. Potts, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1981, Ser. No. 296,948

Int. Cl.³ C07C *2/62;* B01D *53/34*

U.S. Cl. 585—723 **6 Claims**


NON-CONDENSIBLE HF VENT GASES
ABOUT 10 PSIA PURGE GAS
N2 OR INERT NATURAL GAS
HYDROCARBON & HF - CONTAINING GASES & VAPORS 150 PSIA
HIGH PRESSURE RUPTURE DISK (BREAK — 50 PSIA)
SLOW PRESSURE RUPTURE DISK (BREAK — 20 PSIA)
DURING OPERATION 20 PSIA 110°F
ACID RELIEF DROP - OUT DRUM
HIGH LEVEL ALARM
HYDROCARBON WITH SOLUTION HF1 (SIZED FOR 40 GPM)
LOW TEMPERATURE ALARM
HF - FREE GASES TO FLARE
(ABOUT ATMOSPHERIC PRESSURE)
HIGH PRESSURE ALARM
JET
ACID RELIEF NEUTRALIZER
HEATER
MAKE UP CAUSTIC SOLUTION
MAKE UP WATER
STEAM
WASTE CAUSTIC SOLUTION
CONTINUOUS CIRCULATION (SIZED FOR 410 GPM)
TO HF ALKYLATION (SIZED FOR 40 GPM)
DROP - OUT PRESSURE STORAGE

1. In an HF-alkylation operation wherein there are obtained in a stream various light hydrocarbons and HF acid those steps in combination which comprises

(a) passing a vaporous HF acid-hydrocarbon stream containing entrained liquid to an acid relief drop-out zone operating under conditions which remove entrained liquid therefrom,

(b) charging the vaporous stream, reduced in liquid content, obtained in (a) to a neutralizing zone or section operated under conditions such that the vaporous stream is contacted with continuously circulating heated neutralizing agent so that substantially HF-free hydrocarbon vapors are yielded to a flare,

(c) introducing a first portion of a sulfur-free and HF-free gas into a by-pass line which is in open communication with the downstream portion of a low pressure rupture zone or section,

(d) maintaining open pressure communication between said gas in (c) and the upstream portion of said low pressure rupture zone or section and with the downstream portion of a high pressure rupture zone or section, said by-pass line affording a vapor relief safety by-pass for said acid relief drop-out zone when both said high pressure rupture zone or section and said low pressure rupture zone or section are ruptured, and

(e) introducing a second portion of said sulfur-free and HF-free gas in (c) into said drop-out zone or section and passing same therethrough and into and through said neutralizing zone to prevent moisture from entering the system as via the flare.

4,409,421

PROCESS FOR THE PREPARATION OF PURE TERT.-OLEFINS

Jens Herwig; Bruno Schulwitz, both of Cologne; Bernhard Schleppinghoff; Hans-Volker Scheef, both of Dormagen, and Peter M. Lange, Leverkusen, all of Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,225

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124294

Int. Cl.³ C07C *7/01, 7/12*

U.S. Cl. 585—833 **7 Claims**

1. In a process for the preparation of a pure tertiary olefin comprising the steps of:

(A) contacting at least one tertiary olefin in a hydrocarbon stream within which it is in admixture with other hydrocarbons with an alkanol whereby to form an alkyl tertiary alkyl ether;

(B) separating off the residual hydrocarbons which are largely free of tertiary olefins from said alkyl tertiary alkyl ether;

(C) cleaving said alkyl tertiary alkyl ether back to said tertiary olefin and alkanol; and

(D) separating pure tertiary olefin from alkanol,

the improvement wherein:

(E) said alkanol, at the cleavage from said tertiary alkyl ether, is separated off by distilling off from said tertiary olefin to the extent of 60 to 99% by weight;

(F) residual alkanol in admixture with said tertiary olefin is separated from said tertiary olefin by passing the mixture of residual alkanol and tertiary olefin over a synthetic ion exchanger which contains groups which exchange cations or anions or a mixture thereof whereby said alkanol becomes absorbed on said synthetic ion exchanger and substantially pure tertiary olefin is removed; and thereafter absorbed alkanol on said synthetic ion exchanger is desorbed by contacting said synthetic ion exchanger containing absorbed alkanol with a mixture of hydrocarbons containing at least one tertiary olefin; and

(G) reacting said desorbed alkanol from step (F), while in admixture with at least one tertiary olefin to form said alkyl tertiary alkyl ether.

4,409,422

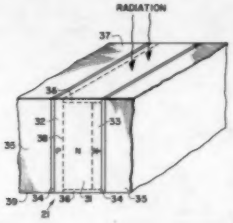
HIGH INTENSITY SOLAR CELL

Bernard L. Sater, 9007 Westlawn Blvd., Olmsted Falls, Ohio 44138

Continuation of Ser. No. 53,923, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 522,244, Nov. 8, 1974, abandoned. This application Dec. 4, 1981, Ser. No. 327,567

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—244 16 Claims



1. A high intensity edge illuminated solar cell comprising:

first, second and third essentially parallel layers of impurity doped semiconductor material and arranged in that order with said first and third layers terminating in opposing essentially parallel first and second major surfaces, said layers having a plurality of edge surfaces extending perpendicularly between said major surfaces;

said second layer being of a first type conductivity and exhibiting a high resistivity on the order of 100 ohm-cm to 1000 ohm-cm, said first layer being of an opposite second type conductivity so as to define a PN junction between said first and second layers and which junction is essentially parallel to said first and second major surfaces;

said third layer being of said first type conductivity but of greater impurity concentration than that of said second layer and the junction of said second and third layers being essentially parallel to said PN junction;

at least one of said edge surfaces adapted for receiving incident radiation and thereby serving as an operating surface, said operating surface being passivated to minimize surface recombination losses; and,

first and second low ohmic resistance metalized layers respectively on said first and second major surfaces, said metalized layers being opaque to radiation.

16. A high intensity solar cell as set forth in claim 1, including a plurality of said cells aligned in series such that the first and second major surfaces of an intermediate cell respectfully face the second and first major surfaces of the next preceding cell and the next succeeding cell.

4,409,423

HOLE MATRIX VERTICAL JUNCTION SOLAR CELL

James F. Holt, Medway, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1982, Ser. No. 356,574

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—255 2 Claims

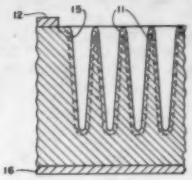
1. A vertical junction solar cell comprising:

a. a semiconductor substrate of predetermined thickness having substantially parallel upper and lower surfaces;

b. a plurality of electrically conducting strips on said upper surface and separating said upper surface into a plurality of distinct active areas, and an electrical header strip joining said conducting strips to provide a first electrical contact for said cell;

c. a second electrical contact on said lower surface; and

d. each of said active areas including a plurality of closely spaced holes of predetermined depth into said substrate, said holes having a substantially circular cross-section and a depth less than said substrate thickness and greater than the diameter of said holes, and being configured in a predetermined array, the walls defining said holes forming the vertical junctions of said cell.



4,409,424

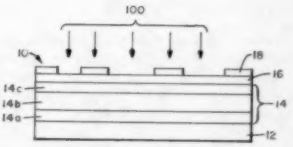
COMPENSATED AMORPHOUS SILICON SOLAR CELL

Genevieve Devaud, Oak Park, Ill., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 21, 1982, Ser. No. 390,730

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—258 21 Claims



1. In an amorphous silicon solar cell which comprises an electrically conductive substrate, a layer of glow discharge deposited hydrogenated amorphous silicon over said substrate and having regions of differing conductivity with at least one region of intrinsic hydrogenated amorphous silicon, said layer of hydrogenated amorphous silicon having opposed first and second major surfaces where said first major surface contacts said electrically conductive substrate, and means for electrically contacting said second major surface, the improvement wherein the intrinsic hydrogenated amorphous silicon region is deposited from an atmosphere containing not less than about 0.2 atom percent mono-atomic boron.

4,409,425

CRYOGENICALLY STABILIZED SUPERCONDUCTOR IN CABLE FORM FOR LARGE CURRENTS AND ALTERNATING FIELD STRESSES

Günter Ries, Weingarten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,013

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048418

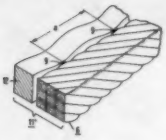
Int. Cl.³ H01B *12/00*

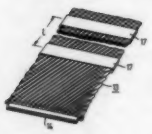
U.S. Cl. 174—15 S 15 Claims

1. In a cryogenically stabilized superconductor in cable form for large currents and alternating field stresses comprising a plurality of superconducting elements which contain twisted conductor filaments of superconductor material embedded in a matrix material of predetermined electric conductivity, said superconducting elements twisted with several stabilizing elements of thermally and electrically highly conductive material which is electrically normally conducting at the operating temperature of the superconductor and the electric conductiv-

ity of which, at the operating temperature, is substantially higher than that of the matrix material of the superconducting elements, disposed parallel thereto, the improvement comprising:

(a) the superconductor being divided into stabilized superconducting subconductors, each comprising a superconducting element and a stabilizing element, the stabilizing element electrically connected to its respective superconducting element only at individual points dispersed one behind the other in the lengthwise direction of the superconductor;





(b) said subconductors being twisted with each other; and

(c) means insulating said subconductors from each other in such a manner that an electrically highly conducting cross connection of all of said subconductors is provided only after one or more twisting lay lengths.

4,409,426

SPLICE CASE

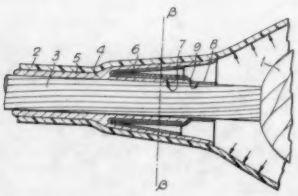
Jean-Marie E. Nolf, Hamme-Mille, and Marc Verschelde, Waregem, both of Belgium, assignors to N.V. Raychem S.A., Kessel-lo, Belgium

Continuation of Ser. No. 87,337, Oct. 23, 1979, abandoned. This application Jan. 27, 1982, Ser. No. 343,254

Claims priority, application United Kingdom, Oct. 27, 1978, 42194/78

Int. Cl.³ H02G *15/32*

U.S. Cl. 174—21 R **18 Claims**



1. A casing for a pressurized segment of an elongate substrate, comprising

a sleeve positionable about the substrate segment to define an enclosure thereabout, said sleeve tapering at the ends thereof to meet the substrate when said sleeve is assembled with the substrate; and

an auxiliary member positionable about the substrate between the substrate and said sleeve at the region where the substrate and said sleeve meet, said auxiliary member being of flexible sheet material having inner and outer arms in cross-section defining an annular channel with the concavity of said channel facing the interior of said enclosure and adapted to allow said channel to open out responsive to pressure within said sleeve, the inner and outer arms of said channel being bondable to the substrate and said sleeve respectively.

4,409,427

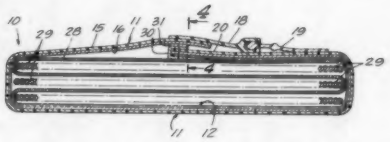
RADIO FREQUENCY SHIELDING JACKET FOR MULTIPLE RIBBON CABLES

Walter A. Plummer, III, 14831 Foxcroft Rd., Tustin, Calif. 92680

Filed Nov. 30, 1981, Ser. No. 325,725

Int. Cl.³ H01B *7/34*

U.S. Cl. 174—36 **5 Claims**



1. A unitary tubular jacket for shielding a plurality of ribbon cables from electrical interference comprising:

inner and outer shielding subassemblies the inner one of which comprises a flexible strip of flexible conductive material foldable into a plurality of accordian pleats forming storage cells for a respective ribbon cable and the outer one of which subassemblies has one lateral edge secured to one lateral edge of said inner subassembly;

a pair of separable interlocking seam members secured to the lateral edge portions of said outer subassembly in a manner providing a guard flap sufficiently wide to bridge and underlie said seam members when interlocked to one another;

said outer subassembly comprising an outer layer of flexible non-conductive material secured to an inner layer of conductive material; and

means, including conductive braids electrically connected to said conductive inner subassembly and secured to the outer side of said guard flap in position to lie in contact with the conductive layer of said outer subassembly when said seam members are interlocked.

4,409,428

OVERHEAD ELECTRIC TRANSMISSION SYSTEMS

Philip Dey, New Barnet; Ronald Dunkley, High Wycombe, and Graham Holden, Bradshaw, all of England, assignors to BICC Public Limited Company, London, England

Filed May 27, 1982, Ser. No. 382,596

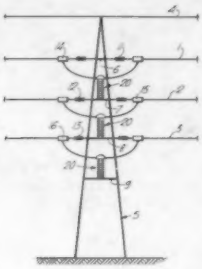
Claims priority, application United Kingdom, Jun. 3, 1981, 8116960

Int. Cl.³ H02G *7/00*; H01B *17/44*

U.S. Cl. 174—43 **15 Claims**

1. In an overhead electric transmission system of the kind in which there is freely supported in long lengths between towers mutually spaced along the system at least one overhead electric conductor which includes at least one optical fibre for the transmission of light, a joint between optical fibres of two overhead electric conductors suspended from a tower, or between optical fibres of an overhead electric conductor suspended from a tower and of a cable extending to a location spaced from the tower, in which each or the overhead electric conductor constitutes a live conductor of the system, which joint is enclosed within a substantially fluid-tight housing of

metal or metal alloy, the housing being electrically connected to each or the said overhead electric conductor, being electri-



cally insulated from earth, and having an external shape of such a form as to provide effective control of electrical stress.

4,409,429

OVERHEAD ELECTRIC TRANSMISSION OR DISTRIBUTION SYSTEM

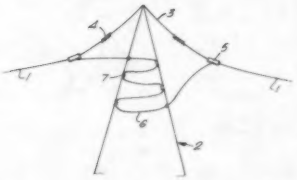
Bernard Gaylard, 2 Ollerbarrow Rd., Altrincham, Cheshire, England

Filed Jun. 18, 1982, Ser. No. 389,683

Claims priority, application United Kingdom, Jun. 16, 1981, 8118526

Int. Cl.³ H02G *7/04, 7/20, 7/22*

U.S. Cl. 174—43 **10 Claims**



1. An overhead electric transmission or distribution system comprising at least one overhead stranded electric conductor comprising at least one layer of helically wound bare elongate elements of metal or metal alloy, at least one elongate compartment within and extending throughout the length of the stranded conductor and, loosely housed in the elongate compartment or at least one of the elongate compartments, at least one optical fibre, which overhead stranded conductor is freely supported in long lengths from towers spaced along the system, wherein at at least one tower of the system at least one said overhead stranded conductor is supported from each of two opposite sides of the tower by suspension means incorporating a weak link designed to fracture at a tensile load substantially less than that which the or each optical fibre of the stranded conductor can withstand before fracturing and wherein an excess length of the said stranded conductor extends between the positions at which said suspension means are secured to the stranded conductor, the arrangement being such that, in the event that the tensile load on the stranded conductor increases to a value greater than that which the weak links can withstand, at least one of the weak links will fracture and the excess length of stranded conductor will reduce substantially the tensile load on the stranded conductor and thereby substantially reduce risk of optical fibre fracture.

4,409,430

MULTIPLE JOINT BOX

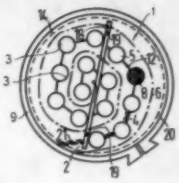
Georg Boscher, Munich, and Wolfgang Haeder, Eichenau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,401

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 3129570

Int. Cl.³ H02G *15/013*

U.S. Cl. 174—92 **26 Claims**



1. A multiple joint box having a longitudinally slitted socket pipe and at least one end-face sealing body with a plurality of cable apertures formed therein for the connecting or distributing of cables, the improvements comprising said sealing body comprising a tape wound spirally into a disk, the thickness of the tape being at least greater than half the diameter of a said cable aperture, said tape having a plurality of semicircular recesses formed at spaced intervals in one side of said tape in an end portion of said tape whose length corresponds to the circumference of said socket pipe, and a plurality of semicircular recesses formed at spaced intervals in both sides of the remaining length of said tape, the spacings of said recesses being selected such that they lie opposite one another in the wound state of said tape, thereby forming circular cable apertures.

25. The method of sealing a plurality of circular cables protruding from a cylindrical pipe which comprises

forming a flexible, resilient sealing tape with a thickness at least equal to one-half the diameter of the cables to be sealed,

forming substantially semi-circular recesses on only one surface of the tape from one end of the tape toward the other a distance at least as great as the dimension of the inner circumference of said cylindrical pipe to provide a non-recessed tape surface on a portion of one surface of said tape,

forming semi-circular recesses on both surfaces of said tape along the remainder of the length of the tape,

winding the said tape about said cables such that each cable is received within complementary substantially semi-circular recesses juxtaposed with one another,

winding said non-recessed portion of said tape last to present a non-recessed tape surface exteriorly of all of the cables,

clamping a seal sleeve over the non-recessed portion of said tape to compress the wound seal tape about said cables, and

sealing said seal sleeve to the inner circumference of said pipe.

4,409,431

OIL WELL CABLE

David H. Neuroth, Bethany, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Aug. 7, 1981, Ser. No. 291,125

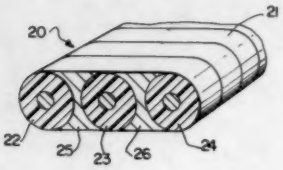
Int. Cl.³ H01B *7/18*

U.S. Cl. 174—103 **38 Claims**

38. An electrical cable comprising:

a pair of elongated, bendable electrical conductors, each comprising a conductor surrounded by a layer of insulation;

first means, located adjacent the insulation on at least one of said electrical conductors and extending substantially across the cross sectional height of the cable, for providing cross sectional rigidity to the cable for resisting compressive forces exerted in a direction transverse to the longitudinal axes of said electrical conductors, while allowing long radius bending transverse to the longitudinal axes of said electrical conductors; and



second means for enclosing said electrical conductors and said first means,

said first means having a height substantially equal to the diameter of the insulation on one of said conductors.

4,409,432

BINDING RETAINING AN ELECTRICAL CONDUCTOR IN A CIRCUMFERENTIAL GROOVE AROUND A RIGID INSULATOR

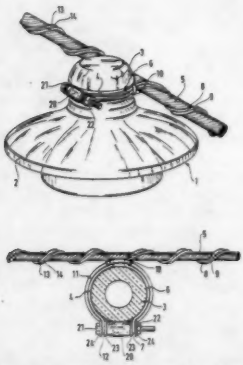
Michel Willem, Abrest, and Lucien Gamet, Saint-Yorre, both of France, assignors to Societe Anonyme dite: Ceraver, Paris, France

Filed Jul. 21, 1982, Ser. No. 400,369

Claims priority, application France, Aug. 5, 1981, 81 15205; Apr. 6, 1982, 82 05929

Int. Cl.³ H01B *17/22*

U.S. Cl. 174—172 **14 Claims**



1. A binding for retaining an electrical conductor in a circumferential groove around a rigid insulator, the binding being disposed substantially symmetrically about a plane of symmetry which passes through the insulator and which is orthogonal to said conductor, and comprising a ring, two conductor-retaining branches, and tightening means for tightening the binding, wherein each of said branches comprises a first end portion in the form of a preformed spiral retainer for wrapping around said conductor, an intermediate portion in the form of an arc of a circle having a radius of curvature that is substantially equal to the radius of the bottom of said circumferential groove, and a second end portion providing an eye for engaging the tightening means, with both branches passing through the ring at the transition between their spiral end portions and their intermediate arcuate portions, and wherein at least one elastomer block is inserted between said eyes to be held in position by said tightening means drawing said eyes towards each other.

4,409,433

BINDING FOR RETAINING AN ELECTRICAL CONDUCTOR IN A TOP GROOVE ON A RIGID INSULATOR WHICH ALSO HAS A CIRCUMFERENTIAL GROOVE

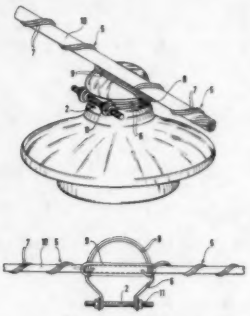
Michel Willem, Abrest, France, assignor to Societe Anonyme dite: Ceraver, Paris, France

Filed Jul. 21, 1982, Ser. No. 400,370

Claims priority, application France, Apr. 6, 1982, 82 05930

Int. Cl.³ H01B *17/22*

U.S. Cl. 174—172 **9 Claims**



1. A binding for retaining an electrical conductor in a top groove on a rigid insulator which also has a circumferential groove, the binding being disposed substantially symmetrically about a plane of symmetry which passes through the insulator and which is orthogonal to said conductor, and comprising a first ring for occupying a portion of the circumferential groove, a second ring for occupying the top groove, two conductor-retaining branches, and tightening means for tightening the binding, each of said branches comprising a first end portion in the form of a preformed spiral retainer for wrapping around said conductor, an intermediate portion for threading through said second ring when lodged in the top groove and through said first ring when lodged in the circumferential groove, and then extending in an arc of the same diameter as the circumferential groove to a second end portion which provides an eye for engaging the tightening means.

4,409,434

TRANSISTOR INTEGRATED DEVICE, PARTICULARLY USABLE FOR CODING PURPOSES

Jean-Claude Basset, Paris, and Alain Meinguss, Meudon la Foret, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Dec. 1, 1980, Ser. No. 211,970

Claims priority, application France, Nov. 30, 1979, 79 29588; Nov. 30, 1979, 79 29589

Int. Cl.³ H01K *1/00*; G06K *19/06*

U.S. Cl. 178—22.19 **23 Claims**

11. An MOS logic integrated circuit comprising:

first and second input terminals E1, E2 adapted to receive respective logic signals relative to a common ground connection;

an output terminal;

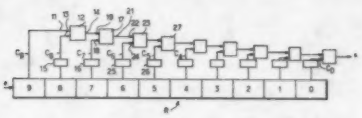
first and second inverting MOS transistors having gates directly coupled to said first and second inputs, said transistors delivering as outputs inverted signals from said first and second inputs, respectively;

first and second processing MOS transistors having gates coupled to receive signals from said first input and to receive said inverted second input signal, respectively;

third and fourth processing MOS transistors having gates coupled to receive said inverted first input signal and to receive signals from said second input, respectively;

the source-drain paths of said first and secondprocessing MOS transistors being serially arranged with those of said third and fourth processing MOS transistors between said output terminal and a ground connection;

fifth and sixth processing MOS transistors arranged in



source-drain parallel relationship and having gates coupled to said first input and to receive said inverted second input signal, respectively;

seventh and eighth processing MOS transistors having gates coupled to receive said inverted first input signal and to receive a signal from said second input, respectively;

the source-drain paths of said fifth and sixth processing MOS transistors being serially arranged with those of said seventh and eighth processing MOS transistors between said output terminal and ground connection;

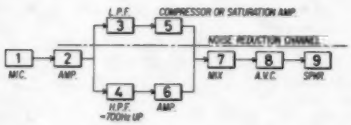
at least one of said processing transitors being doped to be passive and inactive in response to its gate signal.

4,409,435

HEARING AID SUITABLE FOR USE UNDER NOISY CIRCUMSTANCE

Hiroshi Ono, Tokyo, Japan, assignor to Gen Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,552
Int. Cl.³ H04R *25/00*
U.S. Cl. 381—71 **4 Claims**



1. A hearing aid suitable for use under noisy conditions comprising;

a frequency division means for dividing input signals picked up through a microphone into a first low frequency range and a second substantially unattenuated frequency range higher than said first range, said second range having a low frequency cutoff that is no higher than 700 Hz.,

a compensating means for selectively saturating or reducing the output level of one of said ranges including noisy signals therein only when the input level of signals of said one frequency range is higher than the certain level, and

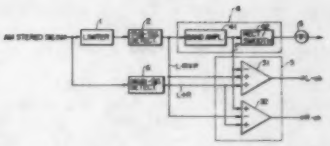
a mixing means for mixing said compensated signals of said one frequency range with non-compensated signals of the other of said frequency ranges.

4,409,436

STEREO PILOT SIGNAL ELIMINATING CIRCUIT FOR AM STEREOPHONIC RECEIVER

Tatsuo Numata; Akira Nishioka, and Hitoshi Hirata, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,562
Claims priority, application Japan, Jun. 19, 1980, 55-85914
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—15 **6 Claims**



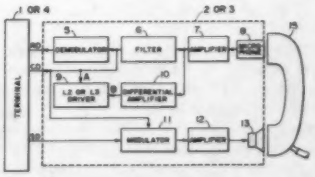
1. An AM stereophonic receiver circuit for an AM stereophonic signal in which a carrier signal is phase modulated by a sub-signal corresponding to a difference between right and left channel signals and amplitude modulated by a main signal corresponding to a sum of said right and left channel signals, comprising: means for receiving and producing an IF signal; a main signal detector having an input coupled to receive said IF signal; a sub-signal detector having an input coupled to receive said IF signal; first and second adder/subtractor circuits, an output of said sub-signal detector being coupled to an addition input of said first adder/subtractor circuit and to a subtraction input of said second adder/subtractor circuit, and an output of said main signal detector being coupled to addition inputs of both said first and second adder/subtractor circuit; and a stereo pilot signal detector circuit having an input coupled to said output of said sub-signal detector, said stereo pilot signal detector circuit producing an output signal corresponding to a pilot signal of a received stereophonic AM modulated signal, said output signal of said stereo pilot signal detector circuit being coupled to a subtraction input of said first adder/subtractor circuit and to an addition input of said second adder/subtractor circuit, a left channel output being produced at an output of said first adder/subtractor circuit and a right channel signal being produced at an output of said second adder/subtractor circuit.

4,409,437

APPARATUS FOR INDICATING TELEPHONE LINE STATE

Sakae Horyu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,444
Claims priority, application Japan, Nov. 2, 1979, 54-141188
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 DP **5 Claims**



1. An apparatus for indicating states of a telephone line, comprising:

means for receiving a plurality of signals from the telephone line in forms distinguishable one from another;

means for indicating a first state of the than a predetermined level is included in said plurality of signals; and

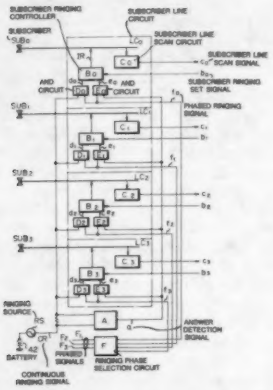
means for disabling said indicating means when said receiving means receives a signal having a predetermined frequency, and for providing a signal causing an external unit connected to said apparatus to indicate that the telephone line is in a second state different from the first state.

4,409,438

RINGING CONTROL CIRCUIT IN A TELEPHONE SWITCHING SYSTEM

Masajiro Akuta, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Japan

Filed May 20, 1981, Ser. No. 265,630
Claims priority, application Japan, May 24, 1980, 55/69223
Int. Cl.³ H04M *3/06*
U.S. Cl. 179—18 HB **3 Claims**



1. A ringing control circuit for a telephone exchange system comprising:

(a) a plurality of subscriber line circuits in a group, each coupled with a subscriber,

(b) a ringing source common to all the subscriber line circuits for providing a continuous ringing signal,

(c) a ringing switch means provided for each subscriber for coupling said ringing source to each subscriber,

(d) a ring trip circuit common to all the subscriber line circuits provided between said ringing source and the subscribers to detect an answer signal of subscribers,

(e) each subscriber line circuit having a subscriber ringing controller for switching said ringing switch means to provide an interrupted ringing signal to a related subcriber, and a subscriber line scan circuit for detecting whether a handset is lifted,

(f) said subscriber ringing controller starting ringing upon arrival of a call to the subscriber and finishing ringing upon detection of an answer signal by said ring trip circuit, characterized in that

(g) a ringing phase selection means is provided, having as its outputs phased ringing signals equal to or less in number than the number of subscribers in a group, said phased ringing signals being alternatively active,

(h) each subscriber line circuit having an AND circuit with two inputs, one input of which is the answer signal provided by said ring trip circuit, and the other input of which is one of the phased ringing signals,

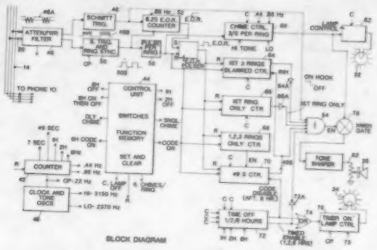
(i) an output of said AND circuit causing a subscriber ringing controller to stop the ringing.

4,409,439

CONTROLLABLE TELEPHONE CALL ANNUNCIATOR

Barry I. Gamble, 9175 Poplar Ave., Cotati, Calif. 94928

Filed Apr. 24, 1981, Ser. No. 257,362
Int. Cl.³ H04M *11/02*
U.S. Cl. 179—84 C **10 Claims**



1. A controllable telephone call annunciator for connection to a telephone line which can supply consecutive ring signals, comprising:

(a) indicating means for providing a humanly-sensible indication in response to a driving signal supplied thereto,

(b) gate means having a plurality of inputs and an output arranged to supply said driving signal to said indicating means when all of said inputs thereof are activated,

(c) coupling means connecting said telephone line to one of the inputs of said gate means such that said one input will be intermittently enabled in correspondence to the respective ring signals on said telephone line,

(d) selectable timer means for selectively supplying a timed activating signal to a second input of said gate means,

(e) selectable sensing means connected to said telephone line for sensing the occurrence of a predetermined ring signal condition on said telephone line and selectively supplying an activating signal on a third input of said gate means in response thereto, and

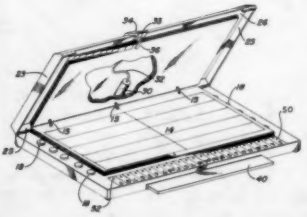
(f) selection means for manually selecting and initiating operation among said selectable timer means, said selectable sensing means, or both said selectable timer means and said selectable sensing means, whereby said indicating means can be selectively disabled or made operational in a plurality of independent modes.

4,409,440

TELEPHONE INDEX AND SWITCH ARRANGEMENT

Robert M. Brodbeck, Littleton, Colo., assignor to Marcamor, Inc., Denver, Colo.

Filed Nov. 25, 1981, Ser. No. 324,788
Int. Cl.³ H04M *1/51*
U.S. Cl. 179—90 BD **10 Claims**



1. Telephone index and combined switch arrangement for memory stored dialing data for automatic dial telephone systems, said arrangement comprising:

(a) multiple card index means for a visual listing of names

and telephone numbers, each card including individual lines for individual numbers;

(b) means to individually visual display a single card thereof;

(c) a light source;

(d) fiber optic means for conducting light enamating from said light source, to said means to individually display one of said cards;

(e) light sensing means having a plurality of identical components, each of which is associated with a separate, individual card, and each of which functions to convert incident light to an electrical impulse, and activate a first circuit to a data block,

(f) selector switch means for each said individual line of a displayed card for activating a second circuit associated with a particular line on a card to retrieve and automatically dial a telephone number stored at a location in the memory associated with said particular line.

4,409,441

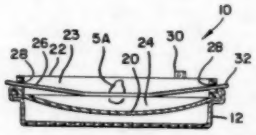
ULTRASONIC TRANSDUCER FOR USE IN A VIBRATORY ENVIRONMENT

Joseph E. Murray, Jr., Malden, and Paul J. Sylvester, Reading, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 2, 1981, Ser. No. 279,722

Int. Cl.³ H04R *19/00*

U.S. Cl. 179—111 R **9 Claims**



1. An electroacoustical transducer assembly, comprising:

a relatively inflexible backplate having an electrically conductive major surface and having another electrically conductive surface electrically connected to said major surface on the opposite side thereof;

a relatively flexible diaphragm having electrically conductive and electrically nonconductive surfaces on opposite sides thereof; and

an electrically conductive spring, having a portion thereof fixedly attached to said electrically conductive opposite-side backplate surface, for connecting said backplate to an electrical circuit, for urging said major backplate surface into engagement with said electrically nonconductive diaphragm surface and for properly tensioning said diaphragm.

4,409,442

HEADPHONE

Tomohiko Kamimura, Habikino, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

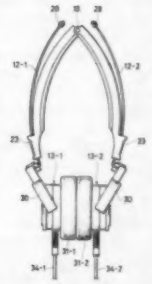
Filed Apr. 30, 1981, Ser. No. 259,223

Claims priority, application Japan, May 12, 1980, 55-64684[U]

Int. Cl.³ H04M *1/05*

U.S. Cl. 179—156 R **2 Claims**

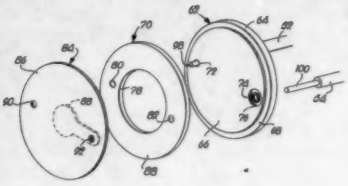
1. A headphone comprising a first resilient band piece of arcuate shape having first coupling means at one end thereof; a second resilient band piece having second coupling means at one end thereof, said second band piece having the same length, width, thickness and shape as said first band piece; connecting means for connecting the other ends of said first and second band pieces to one another with the arcuate shapes of said band pieces lying in a common plane, said connecting means comprising a coupling portion projecting from said other end of said first resilient band piece and having a hole extending therethrough in a direction perpendicular to said common plane, a pair of spaced coupling pieces projecting from said other end of said second resilient band piece in facing relation to the opposing ends of said coupling portion, each of said pair of coupling pieces having a hole therein in alignment with the hole in said coupling portion, a shaft extending through the holes formed in said coupling portion and in said pair of coupling pieces whereby said first and second band pieces can be angularly displaced relative to one another in said common plane about said shaft, the spacing between said pair of coupling pieces being significantly greater than the axial extent of said coupling portion in a direction parallel to said shaft whereby said first and second band pieces can be moved relative to one another along said shaft, bias means comprising a coil spring wound about said shaft between one of said pair of the coupling pieces and said coupling portion for urging said coupling portion along said shaft into engagement with one of said coupling pieces, said coupling portion and said one of said coupling pieces having stepped portions which define planes that extend transverse to said shaft and which are moved into engagement with one another by the biasing force of said coil spring to prevent angular displacement of said band pieces relative to one another about said shaft, said planes being disengaged from one another, to permit relative angular displacement of said band pieces about said shaft, by movement of said coupling portion and said one of said coupling pieces away from one another along said shaft against the biasing force exerted by said coil spring; a first end piece having a length approximately equal to that of said first resilient band piece, said first end piece being slidably coupled with said first coupling means so that substantially the entire length of the first end piece is slidable along said first resilient band piece; a second end piece of the same material, shape, length, width and thickness as said first end piece, said second end piece being slidably coupled with said second coupling means so that substantially the entire length of said second end piece is slidable along said second resilient band piece; and first and second headphone members each of which is covered by an ear pad and each of which includes a transducer for converting an electric signal into an acoustic signal, said first and second headphone members being respectively mounted on said first and second end pieces at positions remote from said connecting means such that when said first and second end pieces are slid relative to their respective coupling means until said headphone members reach said first and second coupling means, respectively, said first and second headphone members are brought into contact with each other through said covering ear pads.



4,409,443
PRESSURE RESPONSIVE ELECTRICAL SWITCHING APPARATUS

Charles N. Tyree; Lester L. Fike, Jr., and Ronald A. McIntire, all of Blue Springs, Mo., assignors to Fike Metal Products Corporation, Blue Springs, Mo.

Filed Jun. 4, 1981, Ser. No. 270,220
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 N **6 Claims**



1. In fluid pressure responsive electrical switching apparatus having a laminated switch assembly including

a diaphragm contact subassembly at one extremity of said assembly and having an upstream face adapted to communicate directly with fluid in a zone to whose pressure said apparatus is to respond and an opposite downstream face,

an intermediate spacer subassembly provided with a laterally inwardly aperture therethrough and having an upstream surface extending around one extremity of said aperture and engaged with said downstream face of said diaphragm contact subassembly and an opposite downstream surface extending around the opposite extremity of said aperture,

a base contact subassembly at the opposite extremity of said assembly and having an upstream face of which a portion is engaged with said downstream surface of said spacer assembly and an opposite downstream face, and

means for securing said subassemblies together in the aforesaid relationship thereof,

said diaphragm contact subassembly comprising a relatively yieldable, electrically insulative diaphragm element having an upstream surface presenting said upstream face of said diaphragm contact subassembly and an opposite downstream surface facing said upstream surface and said one extremity of said aperture of said spacer subassembly, and electrically conductive, first contact structure secured to said downstream surface of said diaphragm element and extending over at least a portion of the latter aligned with said aperture of said spacer subassembly,

said spacer subassembly comprising an electrically insulative spacer element having said aperture therethrough,

said base contact subassembly comprising a relatively rigid, electrically insulative baseplate element having an upstream surface facing said downstream surface and said opposite extremity of said aperture of said spacer subassembly and an opposite downstream surface, and electrically conductive, second contact structure secured to said upstream surface of said baseplate element and extending over at least a portion of the latter aligned with said aperture of said spacer subassembly and with at least a part of said first contact structure,

said first and second contact structures being normally spaced apart when said diaphragm element is in a normal disposition thereof,

said part of said first contact structure being shiftable into engagement with a part of said second contact structure through said aperture when a portion of said diaphragm element aligned with said aperture moves sufficiently in a downstream direction under the influence of a fluid pressure of at least a predetermined level applied to said upstream face of said diaphragm contact subassembly,

there being a fluid chamber in said assembly within said aperture of said spacer subassembly and between said downstream face of said diaphragm contact subassembly and said upstream face of said base contact subassembly,

there being housing means for mounting said switch assembly with said upstream face of said diaphragm contact subassembly in direct fluid communication with said zone,

there being means for peripherally sealing said switch assembly to said housing means to separate said upstream face of said diaphragm contact subassembly from direct fluid communication with said downstream face of said base contact subassembly,

there being electrically conductive lead means for effecting electrical connection with at least one of said contact structures internally of said switch assembly,

said lead means passing through said baseplate element and emanating from said downstream surface thereof,

the improvement of which comprises:

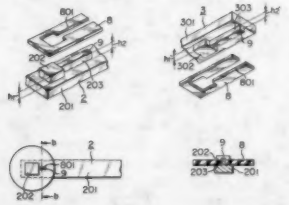
each of said diaphragm element, said spacer element and said baseplate element being provided with a pair of holes therethrough, one of said pair of holes through each of said elements being aligned with each other, the other of said pair of holes through each of said elements being aligned with each other, a portion of said first contact structure extending into adjacency with said one hole through said diaphragm element, a portion of said second contact structure extending into adjacency with said other hole through said baseplate element, and

said lead means including a first lead wire extending through said one holes and said first contact structure and being electrically connected with the latter, and a second lead wire extending through said other holes and said second contact structure and being electrically connected with the latter.

4,409,444
CIRCUIT BREAKER

Hajimu Yoshiyasu, Itami; Fumiyuki Hisatsune, Fukuyama; Shinji Yamagata, Fukuyama, and Junichi Terachi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,676
Claims priority, application Japan, Dec. 9, 1980, 55-175987; Feb. 26, 1981, 56-27918[U]; Feb. 26, 1981, 56-27919[U]
Int. Cl.³ H01H *33/02*
U.S. Cl. 200—144 R **6 Claims**



1. A circuit breaker comprising a pair of contactors comprising rigid conductors with contacts secured thereto, said contactors functioning to open and close an electric circuit, an arc shield disposed on at least one of said contactors, having a resistivity higher than that of said rigid conductors and which surrounds said contact, arc driving means to drive in a predetermined direction an electric arc struck across the gap between said pair of contactors, and an arc runway adjoining said contact provided with said arc shield, which extends in said predetermined direction with a predetermined height, said arc runway having a resistivity lower than that of said arc shield.

4,409,445
CIRCUIT BREAKER

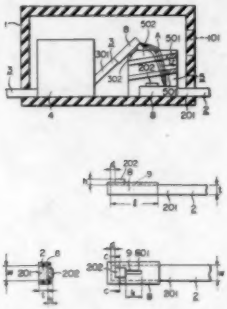
Hajimu Yoshiyasu, Itami; Fumiyuki Hisatsune, Fukuyama; Shinji Yamagata, Fukuyama, and Junichi Terachi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,678

Claims priority, application Japan, Dec. 9, 1980, 55-175984; Feb. 26, 1981, 56-27913[U]; Feb. 26, 1981, 56-27920[U]; Feb. 26, 1981, 56-27922[U]; Feb. 26, 1981, 56-27923[U]

Int. Cl.³ H01H *33/02*

U.S. Cl. 200—144 R **9 Claims**



1. A circuit breaker comprising a pair of contactors comprising rigid conductors with contacts fastened thereto, said contactors functioning to open and close an electric circuit, an arc shield disposed on at least one of said contactors, having a resistivity higher than that of said conductors and which surrounds said contact, arc driving means to drive in a predetermined direction an electric arc struck across the gap between said pair of contactors, and an arc runway adjoining said contact provided with said arc shield and extending in said predetermined direction, and which has a resistivity lower than that of said arc shield and is narrower than the side of said contact to which it adjoins.

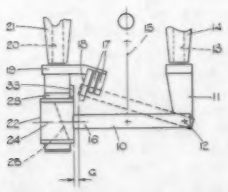
4,409,446
ELECTRICAL SWITCHGEAR

John Parry, Gwent, Wales, assignor to South Wales Switchgear Limited, Wales

Filed Jan. 27, 1982, Ser. No. 343,200

Int. Cl.³ H01H *33/18*

U.S. Cl. 200—147 R **15 Claims**



1. Electrical switchgear employing an electrically insulating fluid for arc extinction and comprising first and second contacts which are movable between open and closed positions, an arcing electrode electrically connected to said second contact, and a field coil electrically connected in series with said arcing electrode, said field coil having a pole face and an axis, said first contact having an end portion which engages said second contact when said contacts are in said closed position and which, when said contacts are moved towards said open position, moves transversely across said pole face of said field coil and inwardly of said axis thereof, movement of said contacts from said closed position to said open position causing an arc to be drawn therebetween such that said arc has a root on said second contact, and further movement of said contacts towards said open position causing said arc root to be transferred from said second contact to said arcing electrode, whereby a magnetic field is generated by an arcing current flowing through said field coil which causes said arc to rotate and become extinguished, a principal arcing zone being defined by such rotation of said arc, said arc being disposed within said principal arcing zone when said root thereof is transferred from said second contact to said arcing electrode, whereby said arc can rotate immediately under the influence of said magnetic field.

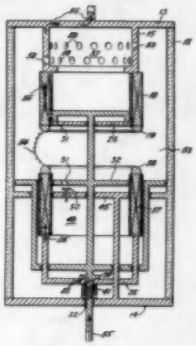
4,409,447
GAS BLAST CIRCUIT BREAKER COMBINING A MAGNETICALLY DRIVEN ROTATING ARC AND A PUFFER INDUCED GAS BLAST

Heinz O. Noeske, Cherry Hill, N.J., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 51,115, Jun. 22, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,747

Int. Cl.³ H01H *33/88, 33/18*

U.S. Cl. 200—148 A **18 Claims**



1. A circuit breaker comprising:

a sealed housing filled with an insulating gas at a predetermined pressure;

first main contact means disposed within said housing;

second main contact means disposed within said housing; said second contact means being movable relative to said first contact means between a first position in which said contact means are in abutment and a second position in which said contact means are separated, and said second contact means being cooperable with said first contact means to carry electrical current when said first and second contact means are in said first position and to interrupt an electrical circuit when said first and second contact means are in said second position;

a first annular auxiliary electrode having an annular arcing surface disposed adjacent said first main contact means;

a second annular auxiliary electrode having an annular arcing surface disposed adjacent said first auxiliary electrode such that said arcing surface of said second auxiliary electrode is adjacent and in axial alignment with said arcing surface of said first auxiliary electrode; said second auxiliary electrode being movable relative to said first auxiliary electrode between a first position in which said first and second arcing surfaces are in abutment and a second position in which said arcing surfaces are separated from each other;

first annular magnetic means disposed in axial alignment with said first auxiliary electrode;

second annular magnetic means disposed in axial alignment with said second auxiliary electrode;

first relatively movable piston and cylinder means disposed within said housing adjacent said first main contact means;

second relatively movable piston and cylinder means disposed within said housing adjacent said second main contact means; and

actuating means including means for moving said second main contact means from said first position to said second position, means for moving said second auxiliary electrode from said first position said second position, means for moving said piston relative to said cylinder of said first piston and cylinder means and means for moving said piston relative to said cylinder of said second piston and cylinder means.

4,409,448

PULL-PUSH SWITCH

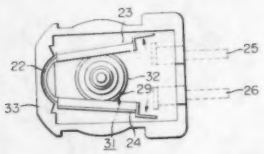
Hiroshi Matsui, Hirakata; Kazuo Sakami, Kobe; Matsuo Nishioka, Hirakata, and Takashi Onizawa, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1981, Ser. No. 316,283

Claims priority, application Japan, Oct. 31, 1980, 55/156665[U]; May 20, 1981, 56/73572[U]

Int. Cl.³ H01H *5/20*

U.S. Cl. 200—153 LA **7 Claims**



1. A pull-push switch comprising:

an operating shaft;

a U-shaped elastic movable contact fabricated by bending a leaf spring disposed astride said shaft;

a stationary contact disposed between the legs of said elastic contact;

a cam securely mounted on said operating shaft so as to be positioned between the legs of said elastic movable contact;

said cam having a small-diameter cylindrical portion and a large-diameter cylindrical portion spaced apart from each other by a predetermined distance in the axial direction, said small-diameter cylindrical portion and said large-diameter cylindrical portion are joined with each other through a tapered intermediate position;

said tapered intermediate portion comprises a first conically tapered portion and a second conically tapered portion; and

the large-diameter bases of said first and second conically tapered portions are contiguous and the small-diameter bases of said first and second conically tapered portions are contiguous with the small- and large-diameter cylindrical portions, respectively;

whereby when said operating shaft is pulled or pushed so that said large-diameter cylindrical portion of said cam forces at least one of said legs of said elastic movable contact to bend outwardly away from said stationary contact, the switch is opened, but when said operating shaft is pushed or pulled so that said legs of said elastic movable contact spring back to rest on said small-diameter cylindrical portion of said cam, said legs are made into and maintained in contact with said stationary contact and consequently the switch is closed.

4,409,449

OPERATING MECHANISM FOR USE IN A CIRCUIT BREAKER

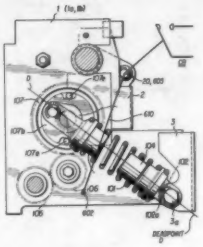
Ikuo Takano, Hachioji; Hiroshi Umino, Inagi, and Junji Fujiwara, Fuchuhonmachi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 94,297, Nov. 14, 1979, abandoned. This application Jun. 8, 1982, Ser. No. 386,395

Claims priority, application Japan, Feb. 13, 1979, 54-14303

Int. Cl.³ H01H *3/30*

U.S. Cl. 200—153 SC **4 Claims**



1. An operating mechanism for use in a circuit breaker having a stationary contact and a moving contact, said mechanism comprising:

a frame;

a shaft disposed on said frame;

link means for actuating said moving contact of the circuit breaker;

accumulating means for accumulating energy for actuating said moving contact and provided between said frame and said shaft;

means for associating said link means with said accumulating means;

means fo driving said accumulating means;

at least one roller clutching means provided between said means for driving said accumulating means and said accumulating means;

biasing means for biasing said link means;

means for operating said link means for closing said moving contact of the circuit breaker by using the accumulated energy of said accumulating means;

means for operating said link means for tripping said moving contact of the circuit breaker by using the energy of said biasing means; and

means for absorbing an an over-loading of said means for driving said accumulating means and provided between said accumulating means and said means for driving said accumulating means wherein said means for absorbing an over-loading as said means for driving said accumulating means comprises:

a connecting element mounted on said shaft and connected with one end of said accumulating means;

a bearing fitting member mounted circumferentially around a first roller clutching means and having at least one predetermined gap, wherein said first roller clutching means is mounted on said shaft; and

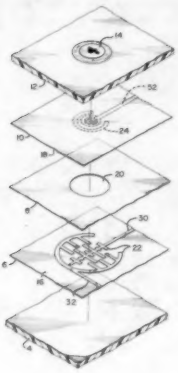
a gear member mounted around said fitting member having at least one stud adapted to fit within said gap of said fitting member, wherein said at least one gap and stud permit relative movement between said bearing fitting member and said gear member, said movement being limited by said predetermined gap.

4,409,450

DOUBLE POLE MEMBRANE SWITCH HAVING PREFERRED SEQUENCE CLOSING FEATURE

Brian J. Blades, Woburn, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 29, 1982, Ser. No. 402,876
Int. Cl.³ H01H 13/54
U.S. Cl. 200—159 B 10 Claims



1. A membrane switch device of the type comprising first and second parallel spaced-apart insulating supports, the supports having opposed first and second surfaces and having opposed contact means on the opposed surfaces forming an electrical switch means, at least one of the supports being flexible whereby upon movement of the supports towards and against each other until the opposed contacts are against each other, the switch means is closed, the switch means being characterized in that:

the contact means on the first surface comprises two electrically separate and adjacent contacts, one of the contacts having a first surface main contact portion and a commoning portion, the other contact on the first surface having a commoning portion which is adjacent to the commoning portion of the main contact portion, the two commoning portions defining a commoning zone on the first surface,

the contact means on the second surface comprises a second surface main contact portion and a second surface commoning portion which is electrically isolated from the second surface main contact portion, the second surface commoning portion being against the commoning zone and the second surface main contact portion being against the first surface main contact portion when the second surface is moved relatively towards and against the first surface,

a second surface circuit conductor on the second surface extends to the second surface main contact portion and first surface circuit conductors on the first surface extend to the two contacts on the first surface whereby,

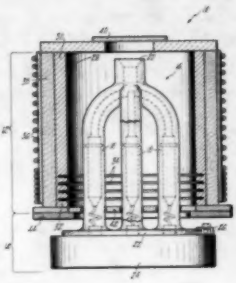
upon relative movement of the second surface towards the first surface, the second surface circuit conductor will be electrically connected to both circuit conductors on the first surface, and the sequence of connection will exclude the possibility of the second surface circuit conductor being connected to the other contact on the first surface prior to its being connected to the first surface main contact portion.

4,409,451

INDUCTION FURNACE HAVING IMPROVED THERMAL PROFILE

Kenneth E. Taylor, Longmeadow, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 31, 1981, Ser. No. 297,900
Int. Cl.³ H05B 6/30, 6/40
U.S. Cl. 219—10.49 R 7 Claims



1. In a casting furnace of the type suited to the production of directionally solidified articles by a withdrawal process and having a cylindrical susceptor with a pour end and a withdrawal end surrounded by induction heating coils, the improvement which comprises:

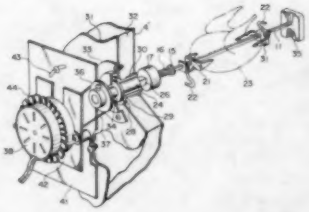
means for establishing a temperature profile within the furnace which is characterized by a peak temperature in close proximity to the withdrawal end of the furnace including a plurality of grooves extending circumferentially about the interior of the withdrawal end of the susceptor for inhibiting the conduction of heat energy out of the furnace at the withdrawal end of the susceptor.

4,409,452

HIGH-FREQUENCY HEATING APPLIANCE

Keiji Oouchi; Isao Takoh, and Hisayuki Serizawa, all of Kashiwa, Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed Jun. 15, 1981, Ser. No. 273,812
Claims priority, application Japan, Jun. 19, 1980, 55-83215
Int. Cl.³ H05B 6/78
U.S. Cl. 219—10.55 E 15 Claims



1. A cooking appliance including a resistive heating element and a high-frequency wave source, comprising:

a heating chamber;

a metal skewer having a length shorter than a horizontal distance between opposed side walls of said heating chamber;

a driving rotation shaft for rotatingly driving said skewer from a first end of said skewer, said driving rotation shaft passing through one of said side walls of said heating

chamber, said driving rotation shaft being formed of a dielectric material;

an electric motor for rotating said driving rotation shaft mounted outside said heating chamber;

a receiver made of dielectric material rotatingly and detachably supporting a second end of said skewer;

a coupling detachably connected to said driving rotation shaft and slidably mounted on said first end of said skewer for transmitting rotational movement of said driving rotation shaft to said skewer, said coupling being formed of a dielectric material;

a spring positioned around said skewer and disposed between a stop integrally formed with said skewer and said coupling for urging said first end of said skewer away from and out of contact with said driving rotation shaft and urging said coupling toward said driving rotation shaft;

a clamping member provided on said skewer and slidable in the longitudinal axial direction of said skewer for holding food products on said skewer; and

power transmission means for connecting a driven portion of said driving rotation shaft and said electric motor without slip therebetween.

4,409,453

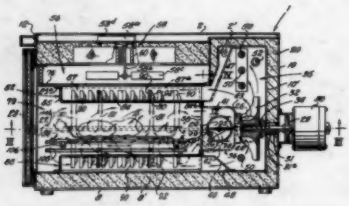
COMBINED MICROWAVE AND IMPINGEMENT HEATING APPARATUS

Donald P. Smith, 4530 Woodfin Dr., Dallas, Tex. 75220

Continuation of Ser. No. 20,968, Mar. 16, 1979, abandoned, which is a division of Ser. No. 687,982, May 19, 1976, Pat. No. 4,154,861. This application Jul. 22, 1981, Ser. No. 286,060

Int. Cl.³ H05B *6/78*

U.S. Cl. 219—10.55 A **3 Claims**



1. Apparatus for heating a food product comprising: a cabinet; a conveyor means adapted to transport a food product through the cabinet; means to deliver a temperature controlled gaseous fluid within the cabinet; a plenum adapted to receive the temperature controlled gaseous fluid from the delivery means; a plurality of ducts communicating with the plenum and extending outwardly therefrom in a direction substantially transverse to the direction of travel of said conveyor means and being further adapted to evenly distribute the flow of said temperature controlled gaseous fluid from said plenum to a cooking compartment disposed within said cabinet, at least one duct being disposed above the conveyor means, at least one duct being disposed below the conveyor means, and at least one additional spaced apart duct being disposed either over or below the conveyor means, each of said ducts being further provided with at least two spaced apart jet plates having a plurality of spaced apertures extending therethrough, the spaced apertures of the spaced apart jet plates being aligned so as to form columnated jets from the temperature controlled gaseous fluid received by the duct from the plenum and to thereafter direct the columnated jets so as to impinge against discrete areas on the surface of the food product, before the columnated jets are substantially diffused, to wipe away a boundary layer of air from the discrete areas against which the streams impinge; and microwave energy generating means adapted to deliver microwave energy to the interior of the cabinet.

4,409,454

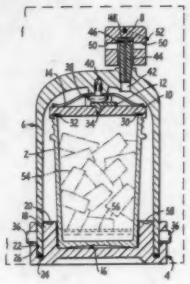
MICROWAVE CANNING APPARATUS

Max P. Beauvais, 46 Southridge West, Tiburon, Calif. 94920, and Raymond E. Camezon, 623 Tunbridge Rd., Danville, Calif. 94526

Continuation of Ser. No. 122,354, Feb. 19, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,279

Int. Cl.³ H05B *6/80*; **A47J** *27/08*

U.S. Cl. 219—10.55 E **6 Claims**



1. An apparatus for use in a microwave oven for canning food products in a non-metallic jar having a mouth, comprising:

a non-metallic jar having a mouth;

a jar lid of non-metallic material and having sealing means for engaging the mouth of the jar and forming an airtight seal therewith under the influence of greater atmospheric pressure outside the jar than inside; and

an enclosure of non-metallic material generally transparent to microwave energy enveloping said jar and said lid and comprising

a base member for engaging the base of said jar and holding said jar in a predetermined position;

a cover member releasably engaging said base member and enclosing at least the portions of said jar and said lid not enclosed by said base member, said cover member and said base member forming a pressure-tight seal therebetween when so engaged as to prevent the entry of gas from outside the enclosure to within the enclosure;

means connected to said cover member for resiliently urging said jar lid against said jar mouth, and

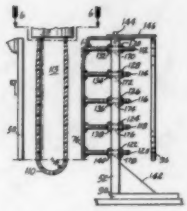
pressure control means communicating with the interior of said enclosure for limiting the maximum pressure within said enclosure to a predetermined amount above the ambient pressure outside said enclosure sealing the enclosure against entry of air, whereby said jar and said lid enclosing a food product and held within the enveloping enclosure may be heated within a microwave oven to form steam of the predetermined maximum pressure within the jar to sterilize the food product and venting the steam from the jar and from the enclosure, with subsequent cooling of the enclosure and the jar causing the pressure within the enclosure and outside the jar to be less than the ambient outside the enclosure and greater than the pressure in the jar, said pressure control means preventing the entry of air into said enclosure, thereby causing the venting of the steam from the jar, again, and to effect an air-tight seal between the lid and the jar when removed from the enclosure.

4,409,455

DIELECTRIC HEATING SECTION FOR BLOW MOLDING MACHINE

Samuel L. Belcher, Cincinnati, Ohio; Timothy R. Peck, Kiawah Island, S.C., and Roger D. Smith, Bethel, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 5, 1982, Ser. No. 355,223
Int. Cl.³ H05B 6/54; B29H 5/26
U.S. Cl. 219—10.81 7 Claims



1. Apparatus for dielectric heating tubular thermoplastic article preforms, each article preform having a formed portion and a formable portion, the formable portion to be heated to the molecular orientation temperature in preparation for biaxial expansion into a finished article, the apparatus comprising:

(a) a radio frequency signal generator for producing an alternating electric potential having a frequency in the radio frequency range;

(b) an electrode pair energizable by the signal generator, the electrodes of the pair arranged to establish an alternating electric field therebetween when energized by the electric potential, the pair having at least one recontourable electrode comprising;

(1) a support post,

(2) a continuous strip attached to the support post with a portion of its length substantially parallel to and facing the other electrode of the pair, the post and strip being less wide than the inside diameter of the preform, and

(3) means for adjustably supporting by the post said portion of the length of the strip, the supporting means providing adjustment of the distance between the strip and the post to define a contour of said portion of the strip; and

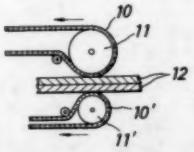
(c) means for rotatably supporting a single preform by its formed portion with the formable portion between the electrodes of the electrode pair, the preforms being located with the inside diameter thereof extending equally beyond the width of the recontourable electrode.

4,409,456

WELDED CAN AND PROCESS FOR PREPARATION THEREOF

Yoichi Kitamura; Hisashi Hotta, both of Yokohama, and Chikara Yurita, Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,824
Claims priority, application Japan, Mar. 8, 1980, 55-28585
Int. Cl.³ B23K 1/16, 11/30
U.S. Cl. 219—64 6 Claims



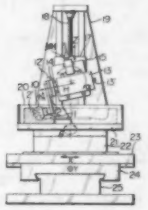
1. A process for the preparatioon of welded cans, which comprises forming a blank comprised of a surface-treated steel plate into a cylinder and passing a lap portion of the formed cylinder between a pair of electrode rollers through an electrode wire to effect electric resistance welding, wherein said surface-treated steel plate comprises a layer of metallic tin or a tin-iron alloy formed on the steel plate substrate in an amount of 0.05 to 0.5 g/m^2 as calculated as metallic tin and a hydrated chromium oxide layer formed on said tin layer in an amount of 0.005 to 0.05 g/m^2 as calculated as metallic chromium and electric resistance welding is carried out in an inert atmosphere in the state where an electrode wire having a plated layer of tin or a tin alloy having a thickness of 0.15 to 2 μm is kept in close contact with the surface of said surface-treated steel plate.

4,409,457

SYSTEM FOR MANUFACTURING TIRE MOLDING METAL MOLDS WITH ELECTRICAL DISCHARGE MACHINING

Kenichi Takahashi; Koichi Hirano, both of Kodaira, and Shoji Futamura, Kawasaki, all of Japan, assignors to Bridgeport Tire Co. Ltd. and Institute of Technology Precision Electrical Discharge Works, both of, Japan

Filed Mar. 3, 1980, Ser. No. 126,199
Claims priority, application Japan, Mar. 8, 1979, 54-26919; Jun. 20, 1979, 54-77653; Jun. 20, 1979, 54-77654; Jun. 20, 1979, 54-77655; Aug. 6, 1979, 54-100046; Dec. 10, 1979, 54-160000
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 M 24 Claims



1. A tire molding metal mold manufacturing method using electric discharge machining for machining a tire molding metal mold having an integrally formed tire molding surface consisting of a predetermined curved surface corresponding to the outer circumference of a tire to be molded and a plurality of projections protruding on said tire molding surface, comprising the steps of: providing an electrical discharge machining equipment having a machining head for feeding a machining electrode which is disposed at a predetermined angular position, in a feeding direction of said angular position, and having a rotatable head support for supporting said machining head at said predetermined angular position; providing a plurality of machining electrodes each having a portion corresponding to a common reference plane determined by the curved surface of said tire molding surface and recesses corresponding to at least one projection protruding on said tire molding surface, a part of said reference plane and a part of said recesses being formed into such a shape so as to prevent excess metal removal during discharge machining, in relation to the feeding direction of said angular position; mounting one of said machining electrodes to said machining head; setting said machining head at a first predetermined angular position corresponding to said one of said machining electrodes; machining a workpiece being machined by feeding said one of said machining electrodes in a feeding direction of said first angular position while preventing excess metal removal; replacing said one of said machining electrodes with another one of said machining electrodes; and machining a portion of said workpiece left unmachined during the step of preventing ex-

cess metal removal, using said other one of said machining electrodes.

4,409,458

EDM METHOD AND APPARATUS WITH THE CONTROLLED SUPPLY OF A LIQUID MACHINING MEDIUM INTO THE GAP

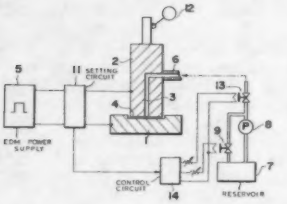
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Apr. 14, 1981, Ser. No. 254,093

Claims priority, application Japan, Apr. 17, 1980, 55-51335; Apr. 21, 1980, 55-52699

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 D **21 Claims**



1. A method of machining an electrically conductive workpiece with a tool electrode spacedly juxtaposed therewith across a machining gap comprising the steps of:

supplying a liquid machining medium into said gap;

effecting a succession of electrical discharges between the tool electrode and the workpiece to electroerosively remove stock from the workpiece with said liquid medium in the machining gap being progressively contaminated with discharge products;

replenishing a predetermined amount in volume of said liquid machining medium into discharge sites of said machining gap to partially replace said contaminated liquid medium to produce such electrical discharges consecutively, and predetermining said amount in volume for each unit weight of said stock removed from the workpiece, said amount in volume per unit weight of stock removed ranging between 400 and 3000 cc/gr; and

presetting the rate of flow of said liquid machining medium replenished into discharge sites of said machining gap in conjunction with at least one of the parameters of said electrical discharges determining the prescribed stock removal by weight per unit time, thereby presetting said amount in volume per unit weight.

4,409,459

AUTOMATIC WELDING APPARATUS

Shuzi Nakayama, Hatano, Japan, assignor to Tokico, Ltd., Kawasaki, Japan

Filed Jun. 18, 1981, Ser. No. 274,733

Claims priority, application Japan, Jun. 19, 1980, 55-84895; Apr. 20, 1981, 56-56666

Int. Cl.³ B23K *11/10, 37/04*

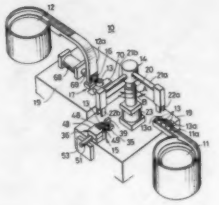
U.S. Cl. 219—86.24 **6 Claims**

1. An automatic welding apparatus comprising:

positioning means successively supplied with a first workpiece, for positioning said first workpiece so that a joint part of said first workpiece faces toward a predetermined direction;

holding and moving means for holding and moving the first workpiece which is positioned by said positioning means;

holding means provided at a position opposing a second workpiece which is successively supplied, for receiving the first workpiece moved by said holding and moving means and holding said first workpiece in a state where the joint part of the first workpiece opposes said second workpiece, said holding means comprising a supporting member loosely inserted into said first workpiece, a stopping member inserted into a depression formed in said supporting member with a gap formed therebetween and movable in the diametrical direction of said first workpiece, said stopping member having a pointed end part projecting from said depression, and means for flowing compressed air within said depression even in a state in which the welding operation is performed, said stopping



member being urged by a force in a direction projecting outward from said depression due to the compressed air supplied into said depression so that said pointed end part pushes against the joint part of said first workpiece, said compressed air being released at a part where said pointed end part pushes against said joint part; and

welding means for welding said first workpiece held by said holding means and said second workpiece in a confronting state, at said joint part of said first workpiece.

4,409,460

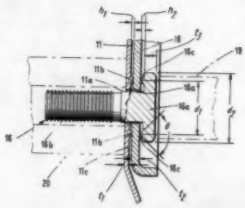
METHOD OF MANUFACTURING A VACUUM BOOSTER HOUSING

Michiharu Nishii, Chiryu, and Atsushi Ohmi, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 14, 1981, Ser. No. 330,503

Int. Cl.³ B23K *11/14*

U.S. Cl. 219—93 **3 Claims**



1. In a method of manufacturing a vacuum booster housing including a body of sheet metal having an annular wall portion, a plurality of bolts disposed in a plurality of spaced holes in said annular wall portion with the heads of said bolts being inside said body and the shafts of said bolts projecting through said holes for securing a brake master cylinder to said booster housing, and an annular reinforcing plate interposed between and in contact with the inner surface of said annular wall portion and the seating faces of the heads of said bolts, the improvement comprising the steps of:

(a) forming on the seating face of the head of each said bolt an annular projection coaxial with the shaft thereof;

(b) forming on the inner surface of said annular wall portion annular projections, each annular projection being coaxial with a respective one of said holes;

(c) placing said reinforcing plate between and in contact

with the annular projections on said bolts and on the inner surface of said annular wall portion, and

(d) simultaneously projection welding said annular wall portion to said reinforcing plate and said reinforcing plate to the heads of said bolts.

4,409,461

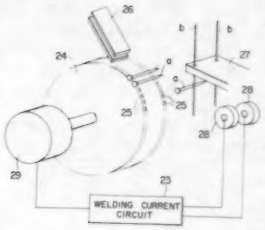
ELECTRICAL RESISTANCE WELDER FOR NAILS USED IN AN AUTOMATIC NAILING MACHINE

Hiroshi Mizutani, Gifu, Japan, assignor to Kabushiki Kaisha Chuo Seisakusho, Aichi, Japan

Filed Sep. 23, 1981, Ser. No. 304,918

Int. Cl.³ B23K *11/00*

U.S. Cl. 219—111 **2 Claims**



1. An electrical resistance welder for welding nails used in an automatic nailing machine comprising:

a rotary disk having grooves cut in a periphery thereof at predetermined intervals for holding said nails;

means for successively feeding nails into said grooves;

means for rotating said disk to successively place said nails in a predetermined welding position;

means for feeding a pair of wires at a constant speed to said position where said wires can be contacted with one of said nails held in said grooves;

a position detector for producing a signal upon each rotation of said disk by a predetermined rotating angle corresponding to said intervals; and

energization means having current supplying elements contacting said wires, for supplying momentary currents through a circuit consisting of said wires and a nail contacted therewith at said welding position each time said signal is produced; said rotary disk, energization means and feeding means cooperating to weld nails across said pair of wires successively so as to make nails suitable for use in an automatic nailing machine.

4,409,462

PROCESS FOR THE NON-CRACKING ENERGY BEAM WELDING OF HIGH TEMPERATURE SHAPED PARTS

Bernd Jahnke, Neckargemünd, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

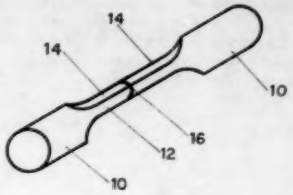
Filed Aug. 11, 1981, Ser. No. 292,007

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030532

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 ED **8 Claims**

1. Process for the crack-free energy beam welding of temperature resistant shaped parts, made of nickel and cobalt-based superalloys containing 5 to 24% chromium, up to 11% molybdenum, up to 2% niobium, tantalum and niobium up to 7%, up to 22% cobalt, up to 6% titanium, up to 7% aluminum, 0.01 to 0.5% carbon, 0.001 to 0.2% beryllium, up to 0.3% zirconium, up to 2% hafnium, up to 6% iron and up to 12% tungsten, balance nickel (all percentages by weight), characterized in that the weld zone and an adjacent area are heated to a preheat temperature of between 1070° to 1180° C. and maintained at said preheat temperature until the temperature has been at least extensively equalized within the weld zone and the adjacent area, the abutting weld surfaces in contact with



each other are melted and welded to each other by means of an energy beam, and the weld zone and the adjacent area are subsequently cooled in a uniform manner.

4,409,463

MACHINE FOR CUTTING SHEET MATERIAL

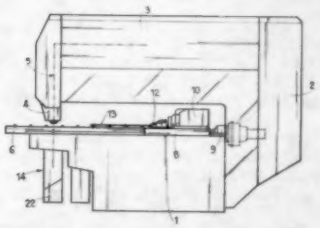
Louis Duruz, Romanel, and Jean-Marc Strehl, Lausanne, both of Switzerland, assignors to Raskin, S.A., Cheseaux/-Lausanne, Switzerland

Filed Oct. 23, 1981, Ser. No. 314,193

Claims priority, application Switzerland, Oct. 23, 1980, 7908/80

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LG **6 Claims**



1. A machine for cutting sheet material by means of a stationary laser beam, comprising a table provided with an opening through which the laser beam passes, and which further comprises, disposed under said table, a deflector means for deflecting rays of the laser beam which ensures the dispersion of the energy of the laser beam and means for recovering the cut-out members, the arrangement being such that said members are not subject to deterioration by the laser beam during continuation of the cutting operations.

4,409,464

AUTOMATIC DEVICE FOR CHANGING AN ELECTRIC WELDING GUN, OPERATED BY THE ARM OF A PROGRAMMABLE MANIPULATOR

Marcello Favareto, Rivoli, and Renato Anselmino, Turin, both of Italy, assignors to Comau S.p.A., Turin, Italy

Filed Jun. 16, 1981, Ser. No. 274,237

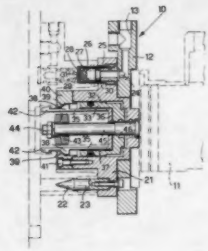
Claims priority, application Italy, Jun. 26, 1980, 67994 A/80

Int. Cl.³ B23K *9/24*

U.S. Cl. 219—136 **8 Claims**

1. An automatic device for changing an electric welding gun, operated by an arm of a programmable manipulator and disposed between the end of said arm of a programmable manipulator and an electric welding gun, comprising two elements (**10**, **50**) which are rigid with said manipulator arm (**11**) and a welding gun respectively, and which can be connected together in a separable manner; means (**19**) for checking

the correct selection of the chosen type of gun and for checking that said element (10) carried by the arm (11) has properly approached this latter, lead-in guide means (22, 60) between the two elements for their mutual insertion, means (42, 71) for releasably coupling together the two elements at the end of their mutual insertion movement, and valve units (31) which automatically open during the coupling together of the two elements in order to directly connect together ducts (13) in the



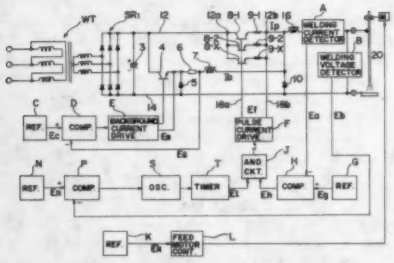
two elements for the passage of a liquid for cooling electrical contacts (15, 16) and electrodes (63) and oil for a closing cylinder (33) thereof, the electrical connection between the manipulator and gun being made by means of two male (66) and female (16) contacts, one provided on the element (10) rigid with the arm (11) and the other in the element (50) rigid with the gun and being coupled together at the moment in which said elements (10, 50) become connected together.

4,409,465

PULSE ARC WELDING METHOD AND DEVICE IN WHICH PULSE CURRENT AND BACKGROUND CURRENT HAVE A CONSTANT CURRENT CHARACTERISTIC

Hideyuki Yamamoto; Waichi Nishikawa, both of Kobe, and Moritoshi Nagasaka, Osaka, all of Japan, assignors to Osaka Transformer Co., Ltd., Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 257,388
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—137 PS **17 Claims**



1. A method of welding a workpiece by an arc produced between a consumable electrode which is fed towards the workpiece at a constant speed and the workpiece, said arc being produced by a pulse current imposed on a background current, said method comprising the steps of:

generating a background current with a constant current characteristic;

generating a pulse current with a constant current characteristic;

controlling the pulse current level to a predetermined level;

imposing the pulse current on the background current;

detecting the welding voltage measured between the consumable electrode and the workpiece for producing a welding voltage signal;

producing a reference signal indicative of a desired welding voltage;

comparing the welding voltage signal with the reference signal for producing a difference signal indicative of the difference therebetween; and

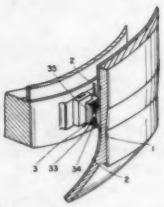
controlling an average value of the welding current by said difference signal such that the average value of the welding current is decreased relative to the increase of said welding voltage signal above a predetermined level, and the average value of the welding current is increased relative to the decrease of said welding voltage signal below said predetermined level, whereby said selding voltage which is in relation to the arc length is maintained constant.

4,409,466

METHOD OF MANUFACTURE OF A HOOP FOR THE VESSEL OF A NUCLEAR REACTOR

Alain Commeau, Montchanin, France, assignor to Framatome, Courbevoie, France

Filed Sep. 30, 1981, Ser. No. 307,260
Claims priority, application France, Oct. 22, 1980, 80 22554
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—137 R **5 Claims**



1. A method of manufacturing a hoop for a nuclear reactor vessel, equipped internally with projecting guide blocks of nickel-base alloy, formed of an outer cylindrical hoop (1) of low-alloy steel coated internally with a thin plating (2) of stainless steel, comprising the steps of

(a) internally coating said hoop (1) with a thin stainless steel plating (2);

(b) attaching supporting blocks (3) to the interior of said hoop (1), leaving bare an area of low-alloy steel of said hoop surrounded by said stainless steel plating (2);

(c) depositing on said area by arc welding a plating (34) of nickel-base alloy until a profile is obtained which projects with respect to said stainless steel plating (2);

(d) machining said nickel-based alloy plating (34) and then welding thereto a separate piece (35) of nickel-base alloy by arc welding with addition of nickel alloy deposited in a groove (4) formed between said nickel-base alloy plating (34) and said separate piece (35).

4,409,467

PORTABLE PRINTING ELECTRONIC CALCULATOR USING MULTIPLE FOLDED RECORDING PAPER

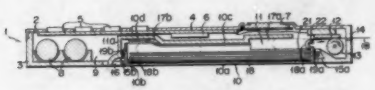
Yoshiaki Honjo, Higashiyamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1980, Ser. No. 214,482
Claims priority, application Japan, Dec. 21, 1979, 54-177569[U]; Dec. 21, 1979, 54-177570[U]; Dec. 21, 1979, 54-177572[U]; Mar. 13, 1980, 55-32715[U]
Int. Cl.³ G06C *29/00*; **B41J** *11/00*
U.S. Cl. 235—58 CF **14 Claims**

4. A compact portable printing electronic calculator comprising:

a calculator body;

a recording paper tape-holding means for holding a multiple-folded recording paper tape therein and in said calculator body, said multiple-folded recording paper tape having a forward end portion, said recording paper tape-holding means including an outlet port having a guide member projecting above the forward end portion of the uppermost portion of the multiple-folded recording paper tape in the recording paper tape-holding means; said guide member comprising means defining a press plane for supporting the forward end portion of the uppermost portion of the recording paper tape which is brought to the outlet port, and means defining a guide plane for guiding the forward end portion of the uppermost portion of the recording paper tape out of said recording paper tape-holding means in an unfolded state; and



a printer located in the calculator body and including means for printing data on the recording paper tape which is guided and delivered out from within the recording paper tape-holding means.

4,409,468

METHOD FOR INDIRECTLY LAYING A WEAPON AND APPARATUS FOR THE PERFORMANCE OF THE METHOD

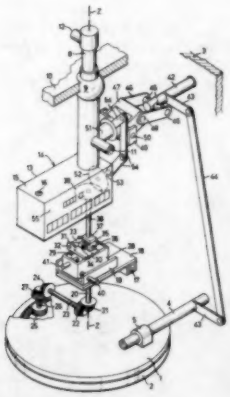
Cornelius Mayer, Fällanden; Jörg Durrer, Oberengstringen, and Ronald Weber, Wettswil, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Continuation of Ser. No. 127,267, Mar. 5, 1980, abandoned. This application Nov. 2, 1981, Ser. No. 317,147

Claims priority, application Switzerland, Mar. 23, 1979, 2738/79

Int. Cl.³ F41G *3/14, 5/14*

U.S. Cl. 235—404 **4 Claims**



4. An apparatus for indirect laying a weapon arranged upon a vehicle at a target with the aid of an electronic firing data computer having a display, comprising:

a first selector switch for inputting to the computer a value representative of an orientation azimuth angle A measured between a reference direction N and an auxiliary direction OA;

a second selector switch for inputting to the computer a value representative of a target azimuth angle Z measured between said reference direction N and the target direction ZA;

a third selector switch for inputting to the computer a value representative of a target elevation angle;

an azimuth code disk for inputting to the computer a value representative of the angle between the auxiliary direction OA and the effective direction of the weapon;

an elevation code disk for inputting to the computer a value representative of the effective elevation angle of the weapon;

a first numerical display cooperating with said computer for indicating the angle between the effective lateral direction of the weapon and the target direction ZA; and

a second numerical display cooperating with said computer for indicating the difference between the effective elevation angle of the weapon and the target elevation angle.

4,409,469

OPTICAL BAR CODE READER

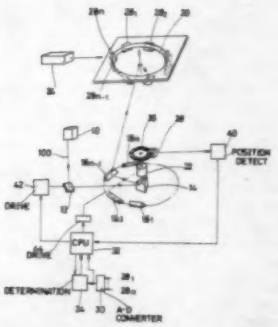
Syoichi Yasuda; Takaaki Okamoto, both of Nara; Kenrow Yatsunami, Yamatokoriyama; Shigeo Terashima, Tenri; Masahiro Horii, Nara; Yoshihiko Iwamoto, Sakurai, and Kiyotsugu Amasaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1981, Ser. No. 226,864

Claims priority, application Japan, Jan. 21, 1980, 55-5989; Jan. 23, 1980, 55-7450

Int. Cl.³ G06K *7/14*

U.S. Cl. 235—463 **3 Claims**



1. An optical bar code reader comprising:

scanning means for providing a plurality of scanning beams separated from each other by a predetermined distance, each said beam scanning successive randomly oriented portions of a bar code label;

light receiving means for developing an output signal in response to each beam developed by said scanning means and scanning at least a portion of the bar code label;

processor means for receiving signals developed by said light receiving means representative of said bar code;

means for combining a plurality of signals developed by said light receiving means for forming a combined signal representative of the entire bar code and for transferring said combined signal to said processor means, said combining means comprising a plurality of storing means for storing a plurality of signals developed in response to scanning beams which scan less than the entire bar code label and composition means for combining said plurality of signals to form said combined signal; and

means for determining if a signal developed by said light receiving means in response to any scanning beam represents the entire bar code, for interrupting operation of said combining means upon determination that a signal developed by said light receiving means represents the entire

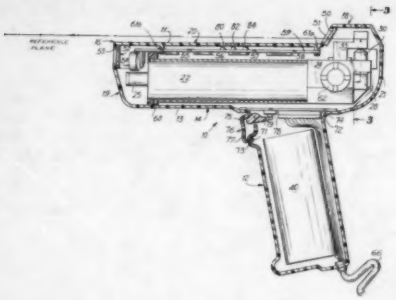
bar code, and for transferring such a signal representing the entire bar code to said processor means.

4,409,470

NARROW-BODIED, SINGLE-AND TWIN-WINDOWED PORTABLE LASER SCANNING HEAD FOR READING BAR CODE SYMBOLS

Howard M. Shepard, Great River; Edward D. Barkan, South Setauket, and Jerome Swartz, Stonybrook, all of N.Y., assignors to Symbol Technologies, Inc., Hauppauge, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,231
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—472 **63 Claims**



1. In a scanning system for reading bar code symbols, a scanning head comprising:

(a) a housing having an elongated body portion including a front region, a rear region, and an intermediate body region extending between the front and rear regions, and having side walls spaced transversely apart of each other by a predetermined width;

(b) light source means mounted within the housing, for generating an incident light beam;

(c) optic means mounted within the housing, for directing the incident beam along a light path towards a reference plane located exteriorly of the housing in the vicinity of the front region thereof, and towards a bar code symbol located in the vicinity of the reference plane to thereby generate a reflected light beam which is directed along a light path away from the reference plane and back towards the housing;

(d) scanning means mounted within the housing at the rear region thereof, for sweeping at least one of said beams over a field of view across the bar code symbol;

(e) sensor means mounted within the housing, for detecting the light intensity in the reflected beam over a field of view across the bar code symbol, and for generating an electrical signal indicative of the detected light intensity;

(f) signal processing means mounted within the housing, for processing the electrical signal to generate therefrom data descriptive of the bar code symbol; and

(g) window means mounted on the housing, and having a light-transmissive window at the rear region in close adjacent confronting relationship with the scanning means thereat, said window being configured and positioned in the light path of said at least one swept beam to permit the latter to pass through the window and unobstructedly travel exteriorly of and past the front and intermediate body regions of the housing,

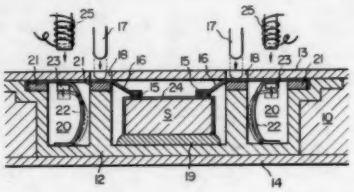
whereby the field of view of the swept beam is substantially independent of the predetermined width of the housing due to its exterior transmission outside of the front and intermediate body regions of the housing.

4,409,471

INFORMATION CARD

Seiichiro Aigo, 3-15-13 Negishi, Daito-ku, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,512
Int. Cl.³ G06K *19/06*
U.S. Cl. 235—492 **4 Claims**



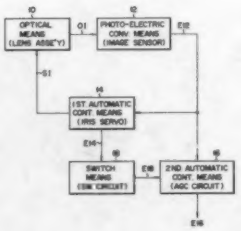
1. In an information card adapted to identify an individual or organization in accordance with security code information, to store an input signal therein or to generate an output signal in response to the input signal and to provide like functions, said card including a metallic casing disposed in an opening which is formed in said card and at least one semiconductor chip seated in said metallic casing and roofed by a cover film, and a conductor strip extending from each of contacts of said semiconductor chip being disposed in such a way that it can be brought into contact with a signal input/output terminal, the improvement comprises that said information card further comprises an elastic member provided in said metallic casing at a location corresponding to the conductor strip and equipped with a magnet at the free end thereof, the conductor strip is fixedly secured to the metallic casing through an insulative material, and, when the conductor strip is spaced apart from the signal input/output terminal, the conductor strip is kept in contact with said magnet or elastic member so that it is electrically connected with said metallic casing through said elastic member, whereby electrically connecting all conductor strips together and protecting said semiconductor chip from electrostatic breakdown.

4,409,472

IRIS SERVO APPARATUS

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1981, Ser. No. 254,299
Claims priority, application Japan, Apr. 28, 1980, 55/56867
Int. Cl.³ G01J *1/20;* H04N *5/34*
U.S. Cl. 250—201 **7 Claims**


OPTICAL MEANS (LENS ASSE'Y)
PHOTO-ELECTRIC CONV. MEANS (IMAGE SENSOR)
1ST AUTOMATIC CONT. MEANS (IRIS SERVO)
SWITCH MEANS (SW. CIRCUIT)
2ND AUTOMATIC CONT. MEANS (AGC CIRCUIT)

1. An iris servo apparatus comprising:

optical means including an iris mechanism and adapted to obtain optical information corresponding to an object being photographed;

photoelectric converting means coupled to said optical means for converting said optical information obtained by said optical means into a first electrical signal;

first automatic control means coupled to said photoelectric converting means and to said iris mechanism for controlling said iris mechanism responsive to said first electrical signal so as to maintain the level of said first electrical signal at a first predetermined level;

switch means coupled to said first automatic control means for detecting how said iris mechanism is controlled by said first automatic control means and for outputting a second electrical signal from said first automatic control means when said iris mechanism of said optical means is controlled to be fully opened; and

second automatic control means coupled to said photoelectric means and to said switch means for generating a third electrical signal responsive to said first electrical signal, the gain of said second automatic control means being controlled responsive to outputting of said second electrical signal by said switch means such that the level of said third electrical signal becomes equal to a second predetermined level;

said first automatic control means alone controlling said iris mechanism and said second automatic control means being substantially inoperable as long as said switch means does not output said second electrical signal; and

said second automatic control means alone controlling said iris mechanism responsive to said switch means outputting said second electrical signal.

4,409,473

APPARATUS FOR DETECTING AN OBJECT

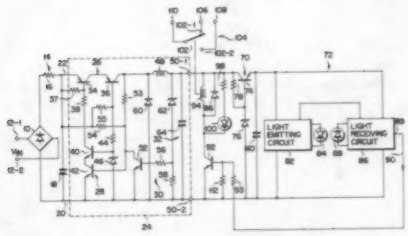
Naofumi Furuta, Konan, and Kunio Ohi, Nagoya, both of Japan, assignors to Sunx Limited, Komaki, Japan

Filed Dec. 31, 1981, Ser. No. 336,186

Claims priority, application Japan, Jan. 9, 1981, 56-2299; Jan. 13, 1981, 56-4490; Mar. 5, 1981, 56-31745

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—206 **9 Claims**



1. An apparatus for detecting an object to be detected, said apparatus comprising:

(a) input means, having outputs respectively connected to first and second lines, for connection to an external power source and for transforming input voltage supplied from the external power source to a predetermined DC voltage;

(b) switching regulator means, connected to said input means through the first and second lines, for chopping the DC voltage applied from said input means at a given duty cycle, said switching regulator means including

(i) an inductive member having at least one end,

(ii) a drive section having at least two transistors connected in series with each other and being arranged between the second line and the one end of said inductive member to perform switching operation, and

(iii) a control section connected to said drive section to control the switching operation of said drive section and having at least two transistors connected in series with each other and at least one zener diode;

(c) detecting means, connected to said switching regulator means so as to be supplied with power from said switching regulator means, for detecting the object to generate an electrical signal; and

(d) output means, connected to said detecting means, for carrying out switching operation in response to said electrical signal and for producing a detection output corresponding to said electrical signal.

4,409,474

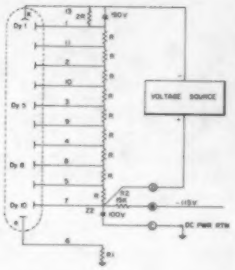
WIDERANGE PHOTOMULTIPLIER CIRCUIT

Robert F. Howarth, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1981, Ser. No. 268,203

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—207 **10 Claims**



1. In a photomultiplier tube having a cathode, dynodes and anode disposed in an envelope in a mutually spaced relationship, an improvement for increasing the linear dynamic range capability comprising:

means coupled between the anode and the dynode nearest the anode for impressing a constant and stable collection potential thereacross.

4,409,475

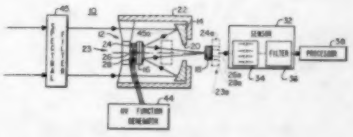
SPATIAL FREQUENCY FILTER

Theodore F. Zehnpfennig, Wayland, Mass., assignor to Visidyne, Inc., Burlington, Mass.

Filed Jul. 29, 1981, Ser. No. 288,155

Int. Cl.³ G02B *27/46*

U.S. Cl. 250—224 **26 Claims**



1. A spatial frequency filter comprising:

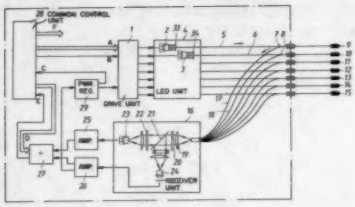
an optical system having detector means and means for projecting onto said detector means an image of an object area; and

means for gyrating said optical system alternately at least in a first mode to develop a first system transfer function and a second mode to develop a second system transfer function which is matched to said first system transfer function in low spatial frequencies for imposing on said detector means a first representation of the image in said first mode and a second representation of the image in said second mode for providing a fluctuating elemental image output from each element of said detector means, which image output derives from a high spatial frequency object.

4,409,476
FIBER OPTIC TEMPERATURE-MEASURING APPARATUS

Folke Löfgren, and Sven-Erik Söderstrom, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Jun. 12, 1981, Ser. No. 273,118
Claims priority, application Sweden, Jun. 16, 1980, 8004447
Int. Cl.³ G01J *5/10;* **G01K** *11/20;* **G08C** *15/06*
U.S. Cl. 250—227 **11 Claims**



1. A fiber optic temperature-measuring apparatus comprising

a plurality of different sensors made of a solid material having temperature-dependent photo-luminescent properties and each arranged in a different location where temperature is to be sensed,

a source of incident light for each sensor which incident light is capable of making the respective sensor luminesce,

an optical fiber for each source and respective sensor positioned to feed incident light from the former to the latter,

a luminescent light receiving unit,

a further optical fiber for each sensor, each said further optical fiber terminating adjacent to the receiving unit and positioned to receive luminescent light from the respective sensor,

electronic measuring means to process the output of the receiving unit, and

means to sequence the operation of said plurality of sources so that the incident light therefrom is time-division multiplexed.

4,409,477
SCANNING OPTICAL SYSTEM

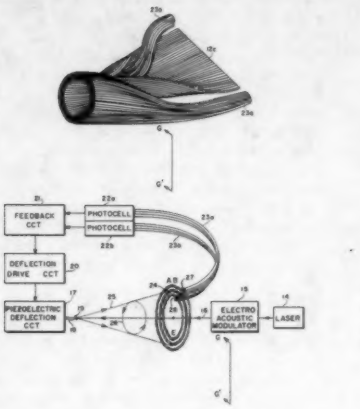
Norman J. Carl, La Habra, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 22, 1981, Ser. No. 276,279
Int. Cl.³ G02B *5/14;* **H01J** *3/14*
U.S. Cl. 250—227 **6 Claims**

1. In a scanning optical system including a collimated light beam, means for deflecting said beam periodically over a predetermined non-linear path and including means for continuously controlling the deflection of said beam comprising:

means for continuously sensing when said beam is being deflected over a path deviating from said predetermined non-linear path over substantially the entire length of said path; and

means responsive to said sensing means for continuously generating a feedback signal which is continuously applied to said deflecting means causing it to substantially simultaneously change the deflection path so that said

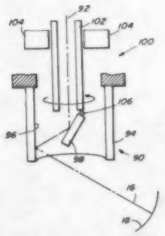


light beam continuously traces said predetermined non-linear path.

4,409,478
METHOD AND APPARATUS FOR IMAGE ACQUISITION UTILIZING A CONCAVE, CYLINDRICAL REFLECTOR

Charles J. Libby, West Roxbury, Mass., assignor to Automatix Incorporated, Billerica, Mass.

Continuation-in-part of Ser. No. 352,597, Feb. 26, 1982. This application Jan. 18, 1983, Ser. No. 458,932
Int. Cl.³ H01J *3/14*
U.S. Cl. 250—236 **15 Claims**



1. Method for image acquisition comprising the steps of:

A. impinging a beam of collimated light on a concave, cylindrical reflective surface to produce a conical beam of light having an angular arc that is a function of the radius of the concave, cylindrical reflective surface and the width of the collimated light beam impinging thereon;

B. illuminating at least a portion of an object with said conical beam of light; and,

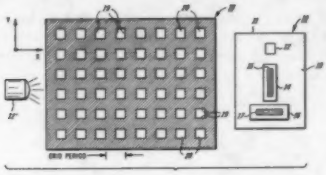
C. imaging at least part of said light beam illuminated portion of the object on an array of photosensitive elements to produce corresponding signals representative of the image on said array.

4,409,479

OPTICAL CURSOR CONTROL DEVICE

Robert A. Sprague, Saratoga, and Donald R. Scifres, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1981, Ser. No. 327,137
Int. Cl.³ H01J 5/16
U.S. Cl. 250—237 G 6 Claims



1. In a cursor control device to provide an output indicative of the amount and direction of movement of the device relative to an orthogonal coordinate system including

a planar grid pattern comprising orthogonally positioned grid lines of uniform spacing, a line and spacing therebetween defining a grid period,

means to illuminate at least a portion of said grid portion,

a housing,

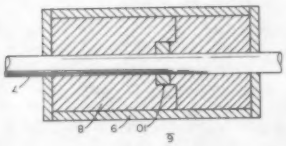
sensor array means mounted in said housing to receive and detect radiation from said grid pattern, said array means comprising optical transducer means for each orthogonal direction, each of said transducer means having an elongated radiation detecting area to receive radiation from an elongated radiation collecting area at the plane of said grid pattern, the length of each of said transducer means radiation collecting area being equal to or greater than a grid period and the width of each of said transducer means radiation collecting area being equal to or narrower than one half of said grid period.

4,409,480

METHOD AND SYSTEM FOR THE TESTING AND CALIBRATION OF RADIOACTIVE WELL LOGGING TOOLS

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,930
Int. Cl.³ G01D 18/00; G01V 5/00
U.S. Cl. 250—252.1 4 Claims



1. Apparatus for calibrating a radioactive logging tool having an epithermal neutron detector and a thermal neutron detector, comprising:

(a) a steady-state neutron source,

(b) means for housing said neutron source so as to permit said neutron source to be placed surrounding said radioactive logging tool,

(c) means surrounding said housing for shielding said neutron source from radioactive ground scattering effects, and

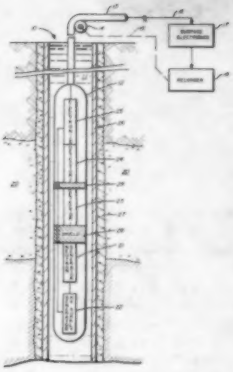
(d) neutron moderating means surrounding said neutron source and said radioactive logging tool, whereby the epithermal neutron detector of said radioactive logging tool is exposed to epithermal neutrons directly from said neutron source and the thermal neutron detector of said radioactive logging tool is exposed to thermal neutrons from said moderating material.

4,409,481

METHOD FOR SIMULTANEOUS MEASUREMENT OF THERMAL NEUTRON DECAY COMPONENTS

Harry D. Smith, Jr.; Ward E. Schultz, and Jerry L. Verbout, all of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 182,151, Aug. 28, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,680
Int. Cl.³ G01V 5/00
U.S. Cl. 250—270 49 Claims



1. A method for simultaneously determining the borehole component and the formation component of thermal neutron decay time of a borehole and earth formations in the vicinity of the borehole, comprising the steps of:

repetitively emitting, in a well borehole, relatively short duration pulses of fast neutrons which are rapidly moderated by interaction with nuclei of materials in the borehole and surrounding earth formations and slowed down to thermal energy, creating repetitive bursts of thermal neutron population in the borehole and surrounding earth formations;

detecting, in the borehole during a time interval between said repetitive pulses of fast neutrons, radiations representative of the thermal neutron population in the borehole and surrounding earth formations, in at least four time subintervals subsequent to a pulse of fast neutrons and generating at least four count rate signals representative of said thermal neutron populations during said at least four time subintervals;

detecting, during a separate time interval between said repetitive bursts of fast neutrons, radiations attributable to a background radiation component of radiation and generating a background count signal representative thereof;

correcting said at least four count rate signals for the presence of said background radiation component to provide at least four background corrected count rate signals;

combining said at least four background corrected count rate signals according to an iterative fitting technique in which exponential relationships are assumed to exist for a borehole and a formation component of thermal neutron decay time to simultaneously obtain two measurement signals representative of the borehole component and the formation component of thermal neutron decay times; and

recording said measurement signals as a function of borehole depth.

4,409,482
STABILIZATION CONTROL FOR A MASS SPECTROMETER

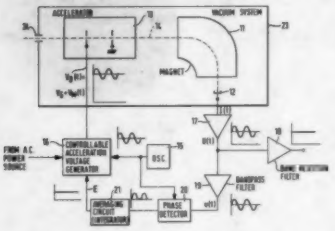
Peter Scheid, Göttingen, and Heinrich Slama, Bovenden, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Göettingen, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,863

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3014053

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—282 **10 Claims**



6. The method of controlling the operation of a mass spectrometer in which an ion stream is accelerated by a unidirectional acceleration voltage and subsequently deflected by a magnetic field to impinge upon an ion collector that generates an output current proportional to the ion concentration in the stream, comprising the following steps:

A. modulating the acceleration voltage with a constant frequency modulation signal voltage having an amplitude smaller than the acceleration voltage range over which the output of the ion collector is equal to or exceeds fifty percent of the maximum current;

B. deriving a modulation signal component from the output of the ion collector;

C. detecting the phase of that modulation signal component to develop an error signal having a polarity indicative of the direction of variation of the acceleration voltage from an optimum condition corresponding to maximum current output from the ion collector;

D. and adjusting the acceleration voltage, in response to the error signal, to reduce the error signal to approximately zero and thereby stabilize operation at the optimum condition.

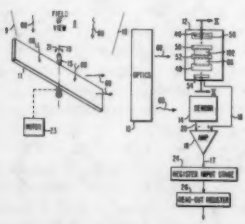
4,409,483
RADIANT ENERGY DIFFERENTIAL SENSOR SYSTEM

Alfred P. Turley, Glen Burnie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1980, Ser. No. 194,720

Int. Cl.³ H01J *31/49;* **G01J** *1/00;* **G01T** *1/24;* **H01L** *27/14*

U.S. Cl. 250—332 **16 Claims**



1. A system for generating an electrical signal representative of amplitude differences in radiant energy from adjacent areas of a target scene to remove unchanging target scene content and background radiation from said electrical signal, comprising:

(a) means for scanning a target scene for directing radiant energy from two adjacent target areas to a first and second means for detecting radiant energy, respectively;

(b) first and second means for detecting radiant energy including means responsive to said radiant energy for generating first and second electrical signals; and

(c) means for comparing said first and second electrical signals to generate a difference signal representative of the difference between said first and second electrical signals representative of target scene radiant energy variations.

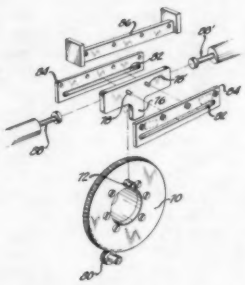
4,409,484
BRAKE ASSEMBLY FOR ROTATABLE SCINTILLATION DETECTOR

Carlos D. Pinkstaff, Chardon, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Sep. 28, 1981, Ser. No. 306,573

Int. Cl.³ G01T *1/166*

U.S. Cl. 250—363 S **8 Claims**



1. In a curved beam apparatus for supporting a rotating scintillation detector of the type having a support arm for supporting the scintillation detector, a carrier member rotatable about its longitudinal axis for retaining the support arm permitting the support arm and scintillation detector to orbit about the longitudinal axis of the carrier member, and a base member for supporting the support arm, a brake mechanism which permits the carrier member to make a complete revolution from a preselected starting position in either clockwise or counterclockwise direction before impeding further travel in said direction, said brake mechanism comprising:

(a) a reciprocating striker member;

(b) guide means disposed adjacent said striker member for defining its reciprocating path;

(c) a pair of dampening means for opposing the reciprocating motion of said striker member and for positionally biasing said striker member; and

(d) means for intermittently coupling said striker member and carrier member such that during an orbit of the detector, said striker member is advanced toward one of said dampening means to decelerate said rotated carrier member and preclude the carrier member from traversing a second revolution in its direction of rotation.

4,409,485

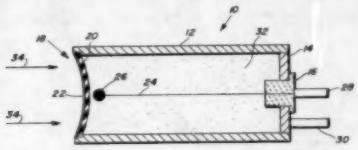
RADIATION DETECTOR AND METHOD OF OPAQUING THE MICA WINDOW

Hayden Morris, Washington, D.C., and Charles Christianson, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1981, Ser. No. 308,740

Int. Cl.³ G01T 1/18

U.S. Cl. 250—374 8 Claims



1. In a radiation detection tube comprising an electrically conducting cylindrical case, an end member attached to one end of said case closing said end of said case, an insulator fitted to said end member, an anode extending coaxially through said insulator and said case, a radiation transparent mica window secured to the end of said case opposite said end member, an opaque to ultraviolet light radiation transparent coating on said mica window, a radiation detection gas contained within said case, wherein the improvement comprises:

said coating being electrically non-conductive preventing electrical arcing between said anode and said coating.

4,409,486

DEFLECTION SYSTEM FOR CHARGED-PARTICLE BEAM

Terence Bates, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,457

Claims priority, application United Kingdom, Jun. 10, 1980, 8018987; Apr. 15, 1981, 8111893

Int. Cl.³ H01J 3/12

U.S. Cl. 250—396 ML 17 Claims

1. An achromatic system for deflecting a beam of charged particles comprising a plurality of spaced successive magnetic deflection means arranged to produce in operation successive deflections of the beam in alternate directions, the system causing substantially no net divergence in position and direction, in each of two mutually perpendicular planes, of the beam leaving the system compared with the beam entering the system, characterised in that said plurality comprises, in succession, first and second magnetic deflection means each for deflecting the beam through an angle not substantially greater than 50 degrees followed by a third magnetic deflection means for deflecting the beam through an angle not substantially less than 90 degrees, and wherein in operation charged particles with different respective energies entering the third deflection means are transversely spaced.

4,409,487

ELECTRODE ARRANGEMENT FOR ELECTROSTATIC DEFLECTION SYSTEM

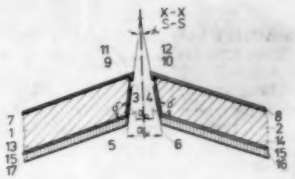
Georg Kuschel, 16, W.-Pieck-Str., JENA-Lobeda, District of Gera, and Hartmut Reinhardt, 59b, Grobschwabhausen, District of Erfurt, both of German Democratic Rep.

Filed May 27, 1981, Ser. No. 267,562

Claims priority, application German Democratic Rep., Jul. 1, 1980, 222294

Int. Cl.³ H01J 37/26

U.S. Cl. 250—398 11 Claims



1. A corpuscular beam processing device comprising subsequently about an optical axis in mutual electron optical alignment

an electron gun for producing a corpuscular beam,

an aperture adjacent to said electron gun for defining said corpuscular beam cross-section,

a first deflection system,

a first electron lens,

a second deflection system,

an electrostatic deflection system,

a black-out aperture,

at least a second electron lens having a center in said optical axis,

a third deflection system,

a target plane,

a slide being displaceably arranged in said target plane,

said first deflection system being for deflecting said corpuscular beam off said optical axis,

said first electron lens being for focusing said corpuscular beam into said electrostatic deflection system,

said second deflection system being for directing said corpuscular beam into said center of said second electron lens,

said second electron lens being arranged adjacent said target plane,

said electrostatic deflection system comprising at least two electrode supporting bodies,

each of said bodies being provided with a face in opposition to the face of the other electrode body, each face having a leading edge in opposition to said second deflection system, the faces of said bodies having a leading edge distance a_o relative to each other and a bottom distance a_u relative to each other where $a_u > a_o$,

each of said bodies having limiting plane faces in opposition to said black-out aperture,

said limiting plane faces including obtuse angles with the associated one of said both faces,

a plurality of electrodes being provided at least on one of said both faces,

said electrodes being of high conductive material compared to the material of said faces,

said electrodes being adjacently arranged along the direction of the greatest extension of said one of said both faces,

each electrode of said plurality of electrodes on said one of said both faces being provided with an individual supply lead,

said one of said both faces being of low electric conductivity compared to the electrode material,

each of said plurality of electrodes is of rectangular shape having two sides in parallel and two sides at right angles

to the corpuscular beam for substantially each deflected off the optical axis position of said corpuscular beam,

said electrostatic deflection system being for deflecting said corpuscular beam off and directing said corpuscular beam to, respectively, said target plane,

said black-out aperture being for trapping said corpuscular beam when deflected off the target plane,

said third deflection system being for fine positioning said corpuscular beam in said target plane,

said second electron lens being for imaging said leading edges into said target plane.

4,409,488

RADIOACTIVE MATERIAL DOSE COMPUTER

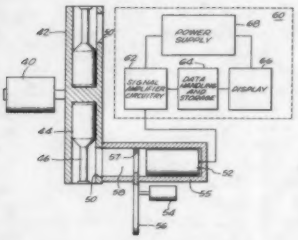
Russell W. King, 1220 Via Granate Ave., Sierra Madre, Calif. 91024

Filed Mar. 6, 1981, Ser. No. 241,026

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ G01N *23/10*

U.S. Cl. 250—432 PD **16 Claims**



1. An apparatus for directly determining the contration of radioactivity of a source in a radiation-shielded closed container and for determining the volume of material to be withdrawn from the container such that the withdrawn volume will constitute a predetermined dose of radioactivity, the determination and withdrawal of the desired amount of radioactive material being accomplished without removing the container from its radiation shield, said apparatus comprising in combination:

(a) a radioactive source container having a body in which the main volume of radioactive material is contained, said container being adapted for isolating an aliquot of predetermined volume of the radioactive material from the main volume;

(b) radiation-shielding means within which said container is enclosed, said radiation- shielding means being adapted for isolating the radiation of said aliquot from that the main volume of radioactive material within said container;

(c) radiation-detection means in operable association with said radiation-shielding means for sensing and converting the radiation from said aliquot into an electrical signal indicative of the concentration of radioactivity in the container.

4,409,489

ROAD TRAFFIC ACTUATED GENERATOR

Thomas J. Hayes, 11 W. 17th St., New York, N.Y. 10011

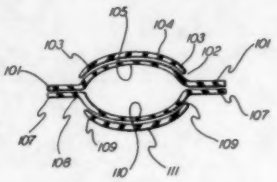
Continuation-in-part of Ser. No. 191,304, Sep. 26, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,340

Int. Cl.³ F03G *5/00;* **F04B** *9/14, 43/12*

U.S. Cl. 290—1 R **27 Claims**

1. An apparatus for recovering energy from a moving vehicle on a roadway by causing a working fluid to flow therefrom, which comprises:

a network of collapsible, resilient bodies, an input manifold and an output manifold coupled thereto wherein each body comprises a structure allowing substantially complete working fluid expulsion therefrom, an inlet connected to the input manifold and an outlet connected to the output manifold, the network forming part of the roadway and having a surface adapted for passage of a vehicle, each body comprising an inner elastic tube and outer, upper and lower sections of semirigid hose, the tube having upper and lower portions with integral projections extending substantially horizontally from the longitudinal sides of each portion, each pair of upper and lower projections forming a continuous, unbroken protrusion or being permanently or detachably joined, the upper and lower portions of the tube being concentrically joined to the



upper and lower sections of hose, the radial dimensions of each hose section being smaller than the radial dimension of the corresponding inner tube portion measured from the extreme horizontal ends of the projections;

a working fluid source coupled to the input manifold;

a means for converting a volume of pressurized working fluid into mechanical or electrical energy;

a means for accumulating a pressure head of working fluid; and

the means for converting and means for accumulating being connected in series or in parallel through a one-way valve to the output manifold.

4,409,490

HYDRAULIC PLANT

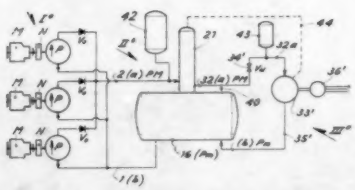
Carmelo Caputo, Rome, Italy, assignor to Solar 77 S.p.A., Rome, Italy

Filed Jul. 31, 1981, Ser. No. 288,766

Claims priority, application Italy, Aug. 5, 1980, 24002 A/80

Int. Cl.³ F03B *13/00*

U.S. Cl. 290—4 D **12 Claims**



1. Hydraulic plant for the dynamometric braking of and the recovery of energy from engines under test comprising a separate pumping unit mechanically connected to and driven by each engine under test and operable to pump fluid at a substantially constant pressure and at a delivery rate which is a function of the power supplied by the associated engine, a hydraulic circuit having a high pressure side to which the pumped fluid is delivered and a lower pressure side for the delivery of fluid to the pumping units, a fluid reservoir connected to said low pressure side of the hydraulic circuit, means for maintaining said reservoir at a substantially low predetermined pressure, a hydraulic motor operable at substantially constant pressure and variable liquid flow rate, an alternating electrical current generator mechanically connected to said hydraulic

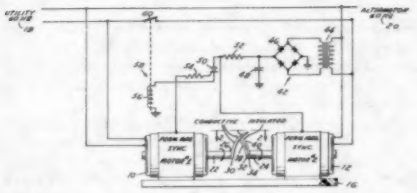
motor and operable to be driven by said motor and to drive said motor, said generator being adapted for connection to external electrical network, a first fluid connection from said motor to said reservoir, a second fluid connection to said motor, valve control means connected between said high pressure side of said hydraulic circuit, said reservoir and said second fluid connection and displaceable as a function of the fluid delivery rate in said high pressure side and the fluid delivery rate in said second fluid connection demanded by said hydraulic motor to control the delivery of fluid from said high pressure side to said reservoir and to said second fluid connection, said valve control means being operable to at least partly place said high pressure side in communication with said reservoir when the fluid delivery rate in said high pressure side is greater than the delivery rate demanded in said second fluid connection and to at least partly interrupt delivery of fluid from said high pressure side to said second conduit when the fluid delivery rate in said high pressure side is less than the delivery rate demanded in said second fluid connection and a non-return valve connection between said second fluid connection and said reservoir to supply fluid to said motor when the fluid delivery rate in said high pressure side falls to zero and the motor is driven as a pump by the alternator from the external electrical network.

4,409,491

AC FREQUENCY AND PHASE SYNCHRONIZER

Lawrence A. Schott, 15940 Warwick Rd., Detroit, Mich. 48223

Filed Dec. 27, 1982, Ser. No. 453,619
Int. Cl.³ H04B *3/44*
U.S. Cl. 307—77 **14 Claims**



1. A system for detecting frequency and phase synchronism between two a.c. power sources comprising a pair of dynamoelectric motors each having an electrically conductive housing and an output shaft, means mounting said motors with said output shafts in opposed coaxial orientation and with at least one of said motor housings ungrounded, means for connecting said motors to respective ones of said power sources such that said opposed shafts are adapted for rotation in opposite directions, means mounted on said opposed shafts and responsive to electrical synchronism between said sources for effecting a change in electrical interconnection between said motor housings through said shafts, and means responsive to said change in electrical interconnection of said housings through said shafts for indicating such electrical synchronism.

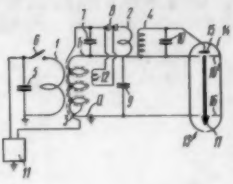
4,409,492

SHOCK EXCITED PULSE TRANSFORMER

Evgeny A. Abramian, Moscow, U.S.S.R., assignor to Institut Vysokikh Temperatur Akademii Nauk SSSR, Moscow, U.S.S.R.

PCT No. PCT/SU80/00074, § 371 Date Jan. 4, 1982, § 102(e) Date Jan. 4, 1982, PCT Pub. No. WO81/03254, PCT Pub. Date Nov. 12, 1981
PCT Filed May 5, 1980, Ser. No. 336,351
Int. Cl.³ H02M *9/02*
U.S. Cl. 307—108 **2 Claims**

1. A shock excited pulse transformer comprising a primary winding, a secondary winding, a capacitor, a charging device and a switch mechanism in the circuit of the winding, wherein the improvement comprises at least two stages, each having a primary winding equipped with a capacitor and a switch device and a secondary winding, the secondary windings being connected in series and in all stages except the last one coiled



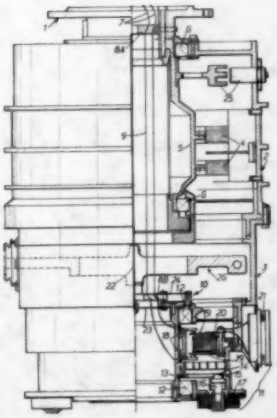
with two parallel conductors insulated from each other, in the first stage a first conductor is connected to an output of the charging device and a second conductor is grounded, and in all other stages capacitors of the circuits of the primary windings are inserted between said conductors in parallel.

4,409,493

METHOD AND DEVICE FOR THE TRANSMISSION OF ELECTRIC POWER BETWEEN PARTS TURNING AT LOW SPEED

Jean-Claude Le Stang, Toulouse, and Georges Thomin, Tolosan, both of France, assignors to Centre National d'Etudes Spatiales, France

Filed Jun. 26, 1981, Ser. No. 277,496
Claims priority, application France, Jun. 27, 1980, 80 14381
Int. Cl.³ H01H *47/00*
U.S. Cl. 307—132 R **14 Claims**



4. A device for transmitting electrical power between a fixed part and a turning part, said device comprising:

(a) at least one movable intermediate part,

(b) a flexible electrical conductor connecting the intermediate part to the turning part,

(c) a driving device located between the intermediate part and the turning part,

(d) clutching means for coupling and uncoupling the intermediate part and the fixed part,

(e) electrical switching means for electrically connecting and disconnecting the intermediate and fixed parts,

(f) a position detector, and

(g) control means located between the position detector and the electrical switching means and the clutching means for

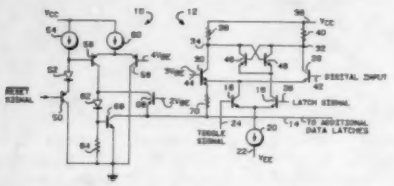
activating said electrical switching means and said clutching means.

4,409,494

RESET CIRCUIT FOR DATA LATCHES

Gregory J. Smith, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 21, 1982, Ser. No. 341,049
Int. Cl.[3] H03K 17/20, 17/62
U.S. Cl. 307—238.3 9 Claims



1. A reset circuit having an input terminal and an output terminal, said input terminal responsive to a reset signal having first and second states, comprising:

a first NPN transistor having a collector coupled to said output terminal and an emitter coupled to a first bias voltage, for sinking current from said output terminal;

means coupled to said input terminal and a base of said first NPN transistor for biasing said first NPN transistor when said reset signal is in said first state; and

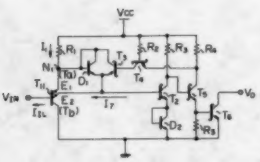
a second NPN transistor for limiting current from said output terminal, said second NPN transistor having an emitter coupled to said output terminal, a base coupled to said first threshold voltage, and a collector coupled to said means.

4,409,495

SCHMITT TRIGGER CIRCUIT WITH LOW INPUT CURRENT

Hiromu Enomoto, Kawasaki; Yoshiharu Mitono, Tokyo; Yasushi Yasuda, Inagi; Taketo Imaizumi, Fukuoka, and Hiroshi Ohta, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1981, Ser. No. 268,643
Claims priority, application Japan, May 29, 1980, 55-71804
Int. Cl.[3] H03K 3/295
U.S. Cl. 307—290 13 Claims



1. A Schmitt trigger circuit having an input-voltage hysteresis characteristic, comprising:

an input stage comprising a first transistor which is a multi-emitter transistor having first and second emitters, and a first load resistor connected to said first emitter at a node;

an output stage comprising a second transistor having a base connected to said second emitter of said first transistor;

a first pn junction diode having an anode connected to said node and a cathode connected to the base of said second transistor, for turning on said second transistor by applying a voltage lower than the voltage at said node by the amount of the voltage drop across said first pn junction diode;

a third transistor having a collector and an emitter connected to said first pn junction diode, for providing said input-voltage hysteresis characteristic; and

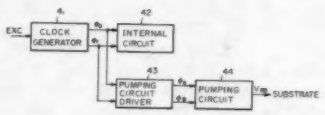
a switching circuit, connected to said second and third transistors, for turning on said third transistor in response to a turning on of said second transistor.

4,409,496

MOS DEVICE INCLUDING A SUBSTRATE BIAS GENERATING CIRCUIT

Fumio Baba, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00124, § 371 Date Feb. 5, 1981, § 102(e) Date Jan. 28, 1981, PCT Pub. No. WO80/02773, PCT Pub. Date Dec. 11, 1980
PCT Filed Jun. 4, 1980, Ser. No. 232,032
Claims priority, application Japan, Jun. 5, 1979, 54-70382
Int. Cl.[3] H03K 3/353; H03L 7/24
U.S. Cl. 307—296 R 6 Claims



1. An MOS device including a substrate bias circuit for controlling the potential on a substrate containing said MOS device, comprising:

a clock generator for receiving an external clock signal and generating first and second internal clock signals;

a circuit internal to said MOS device connected to said clock generator and operated by said first and second internal clock signals;

a pumping circuit driver, connected to said clock generator, for receiving said first and second internal clock signals and generating third and fourth internal clock signals which are in synchronization with said first and second internal clock signals and are in opposite phase with each other; and

a pumping circuit connected to said pumping circuit driver and said substrate and driven by said third and fourth internal clock signals, for generating a potential for biasing said substrate when said pumping circuit effectuates a pumping operation, said pumping circuit effecting said pumping operation when the potential on said substrate is higher than a predetermined value.

4,409,497

WINDOW COMPARATOR CIRCUIT

Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 11, 1981, Ser. No. 262,498
Claims priority, application Japan, May 29, 1980, 55-71722
Int. Cl.[3] H03K 5/153, 5/24; G01R 19/165
U.S. Cl. 307—360 3 Claims

1. A window comparator circuit comprising:

an input terminal to be supplied with an input signal;

a first reference voltage terminal to be supplied with a first voltage;

a second reference voltage terminal to be supplied with a second voltage lower than the first voltage;

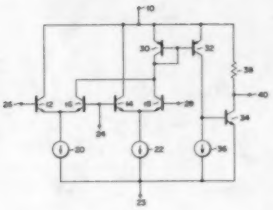
first differential amplifier means having a first transistor whose base is connected to the first reference voltage terminal, and a second transistor whose base is connected to the input terminal and whose emitter is connected to an emitter of the first transistor;

a first constant current source for supplying a first constant

current and connected to the emitters of said first and second transistors;

second differential amplifier means having a third transistor whose base is connected to the input terminal, and a fourth transistor whose base is connected to the second reference voltage terminal and whose emitter is connected to the emitter of said third transistor;

a second constant current source for supplying a second constant current having the same value as the first constant current and connected to the emitters of said third and fourth transistors;



a current mirror circuit to be supplied with one of the sum of collector currents of said second and fourth transistors and the sum of collector currents of said first and third transistors;

a third constant current source for supplying a third constant current having a value different from the first and the second constant currents and connected to an output terminal of said current mirror circuit; and

an output transistor whose base is connected to an output terminal of said current mirror circuit.

4,409,498

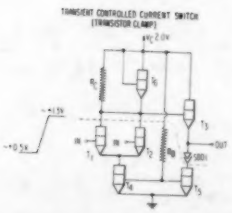
TRANSIENT CONTROLLED CURRENT SWITCH

Jack A. Dorler, Wappingers Falls, and Joseph M. Mosley, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,684

Int. Cl.³ H03K *17/16, 19/092*

U.S. Cl. 307—454 **11 Claims**



1. A current controlled gate comprising at least one input transistor receiving a logic input signal, a voltage source, a pair of transistors coupled to operate as a current mirror, means coupled to said voltage source and to the bases of said pair of transistors to insure that one of said pair of transistors will be driven into saturation dependent on the state of said input transistor, and an output transistor connected to said voltage source and responsive to said input transistor state and a current from said current mirror which is dependent upon the saturation state of one of said pair of transistors to produce a logic output.

4,409,499

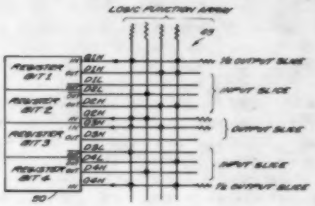
HIGH-SPEED MERGED PLANE LOGIC FUNCTION ARRAY

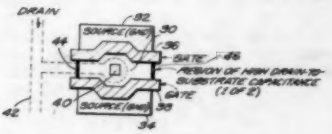
John M. Zapisek, Hauppauge, and Gus Giulekas, West Hempstead, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,160

Int. Cl.³ H03K *19/177, 19/094;* **H01L** *29/78;* **G06F** *7/48*

U.S. Cl. 307—468 **6 Claims**





1. In a programmable logic array comprising an array of input and output lines and a plurality of product term lines intersecting said input lines and said output lines, and MOS devices having gate and drain terminals formed at selected intersections of said product term lines and said input lines and said output lines, said product term lines being connected to the drains of said MOS devices on said input lines and to the gates of said MOS devices on said output lines, said MOS devices being provided in the form of dual-device structures, each of which comprises a pair of doped silicon source regions, an intermediate doped silicon drain region, and a pair of spaced polysilicon terminals overlying and extending beyond said source and drain regions, said input lines and said output lines and their associated MOS devices being arranged in a direction orthogonal to the direction of said product term lines.

4,409,500

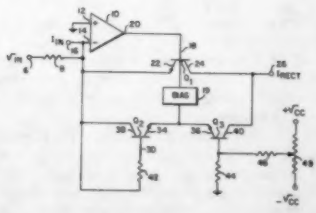
OPERATIONAL RECTIFIER AND BIAS GENERATOR

David R. Welland, Boston, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Mar. 26, 1981, Ser. No. 247,811

Int. Cl.³ H03K *17/00;* **G06G** *7/12*

U.S. Cl. 307—490 **23 Claims**



1. A device for rectifying an AC current input signal applied at its input terminal and adapted to have its output be a current

source, said device comprising, in combination (1) an amplifier stage having an inverting input terminal coupled to the input terminal of said device, and an output terminal, (2) a first transmission path including first current conveying means (a) coupled selectively to provide signal transmission between the input and output terminals of said device and (b) connected so that said selective signal transmission over said first transmission path is controlled by the output signal provided at said output terminal of said amplifier stage, wherein a first current flows between the input and output terminals of the device along said first transmission path only when said input signal is of a first polarity; and (3) a second transmission path including second current conveying means (a) coupled selectively to provide signal transmission between the input and output terminals of said device and (b) connected so that said selective signal transmission over said second transmission path is controlled by the output signal provided at said output terminal of said amplifier stage wherein a second current flows between said input and output terminals of said amplifier stage along said second transmission path and an inverted current substantially equal in magnitude but opposite in polarity to said second current simultaneously flows between the output terminal of said amplifier stage and the output terminal of said device along said second transmission path only when said input signal is of a polarity opposite said first polarity, the improvement wherein:

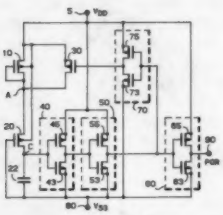
said first and second current conveying means, each include means for respectively poviding a maximum limit of unity voltage feedback with respect to said amplifier stage.

4,409,501

POWER-ON RESET CIRCUIT

Curtis L. Eickerman, and Arlie A. Ramsey, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 20, 1981, Ser. No. 284,415
Int. Cl.³ H03K *17/22, 17/284, 17/687*
U.S. Cl. 307—594 **7 Claims**



6. A reset circuit, responsive to an applied voltage and having a first and second voltage terminal, comprising in combination:

a first FET having a source, a gate, and a drain coupled to said gate;

a second FET having a source coupled to said drain of said first FET, a gate, and a drain, said gate of said second FET being coupled to said second voltage terminal;

a capacitor having a first electrode coupled to said drain of said second FET to form a first node, said first FET, said second FET, and said capacitor being connected in series between said first and second voltage terminals;

a first inverter having an input coupled to said first node and providing an output;

a second inverter having an input coupled to said output of said first inverter and providing an output;

a third inverter having an input coupled to said output of said second inverter to form a second node, said third inverter having an output providing a reset pulse which is the output of the circuit; and

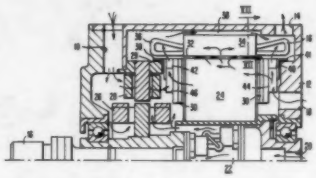
means for providing feedback from said second node to said first electrode of said capacitor to maintain said capacitor at a predetermined voltage level.

4,409,502

SELF-COOLED ELECTRICAL MACHINE WITH INTEGRATED FAN AND SALIENT POLE ROTOR

Jack L. McCabria, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1981, Ser. No. 331,725
Int. Cl.³ H02K *1/32*
U.S. Cl. 310—61 **8 Claims**



1. A self-cooled electrical machine comprising:

a frame having a plurality of inlet and outlet ports;

a stator assembly within said frame, said stator assembly having a plurality of axial stator cooling passages;

a rotor within said frame, said rotor including a plurality of poles with interpole spaces between said poles;

a plurality of wedges each disposed within one of said interpole spaces, and each having two radially disposed legs and one circumferentially disposed surface;

said radially disposed legs and said circumferentially disposed surface of each of said wedges forming an axial rotor cooling passage extending along the length of said wedge and having a plurality of apertures in said circumferentially disposed surface;

said axial stator cooling passages having an opening which is in radial alignment with at least one of said apertures in each of said wedges;

a plurality of radial vanes, one of said vanes being attached to one end of each of said wedge legs wherein one of said vanes extends from each end of said wedges to a point beyond said interpole space;

an impeller tab attached to each end of each of said wedges said tabs propelling coolant radially as said rotor turns; and

a shroud attached to each end of each of said wedges, said shrouds preventing recirculation of coolant after said coolant has been propelled by said impeller tabs.

4,409,503

ROTARY ASSISTANCE DEVICE, MORE ESPECIALLY FOR VEHICLE STEERING

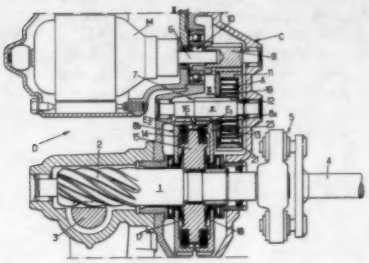
Andre Barthelemy, Saint Remy les Chevreuse, France, assignor to Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Oct. 15, 1981, Ser. No. 311,604
Claims priority, application France, Oct. 20, 1980, 80 22407
Int. Cl.³ H02K *7/10*
U.S. Cl. 310—75 D **6 Claims**

1. A rotary assistance device for coupling to a driven member which is able to rotate in both directions in response to the rotation of a drive shaft, comprising:

a motor rotatable at a relatively high speed in relation to the speed of the drive shaft and the driven member;

speed reducing means for reducing the speed of the motor comprising at least one pinion driven by said motor and



angular torque damping means of high flexibility disposed inside said at least one pinion;

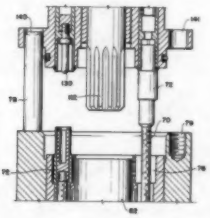
friction coupling means for driving the driven shaft.

4,409,504

TANDEM CONNECTED SUBMERSIBLE OIL WELL PUMP MOTORS

Brown L. Wilson, and Joseph T. Carle, both of Tulsa, Okla., assignors to Oil Dynamics, Inc., Tulsa, Okla.

Division of Ser. No. 45,312, Jun. 4, 1979, Pat. No. 4,350,911.
This application Sep. 8, 1981, Ser. No. 300,176
The portion of the term of this patent subsequent to Sep. 21, 1999, has been disclaimed.
Int. Cl.³ F04D *13/08*; H02K *5/10*
U.S. Cl. 310—87 **3 Claims**



1. In a submersible motor assembly used to drive a pump for pumping fluids from wells having, tandemly arranged, a lower motor assembly and an upper motor assembly, each motor assembly having a longitudinal housing with top and bottom ends, an electric motor, rotor-driven longitudinal shaft, thrust bearings supporting the shaft, oil corridor means within the shaft, and housing to permit the circulation of oil contained within the housing, and internal electrical leads to the motor and splined connection for the shafts, the improvement characterized by:

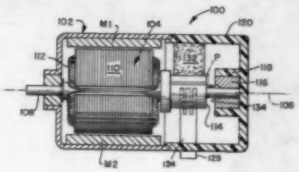
electrical connection means between the lower and upper motor assemblies comprising, at the top of the lower assembly, a socket, an insulated female receptacle, connected to the internal electrical lead, which is spirally wrapped inside the housing, the receptacle movable from the socket for initial connection with an insulated male terminal fixed at the bottom of the upper assembly just prior to connecting the motor assemblies, and positionable in the socket when connected.

4,409,505

ELECTRIC MOTOR HAVING IMPROVED OPERATING CHARACTERISTICS

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 15, 1981, Ser. No. 263,975
Int. Cl.³ H02K *5/14*
U.S. Cl. 310—90 **6 Claims**



1. An electric motor comprising in combination:

a housing including means for establishing a stator field;

an armature including a commutator and a rotor shaft;

bearing means supporting said rotor shaft for rotation with respect to said stator;

a brush arrangement comprising at least one brush including a terminal portion integrally formed of base metal resiliently biased into contact with said commutator; and

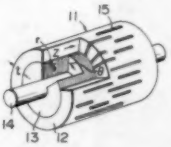
means for providing a supply of synthetic non-organic commutator enhancing lubricant to the area of or adjoining said commutator to enhance commutation with said brush arrangement and thereby reduce the voltage drop from said terminal portion to said commutator.

4,409,506

INDUCTION MOTOR

Motoya Ito; Noboru Fujimoto; Noriyoshi Takahashi; Masatoshi Watanabe, all of Hitachi, and Seizi Yamashita, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,841
Claims priority, application Japan, Jul. 28, 1980, 55-102362
Int. Cl.³ H02K *1/22, 17/00*
U.S. Cl. 310—166 **20 Claims**

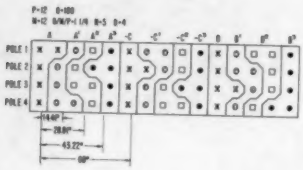


1. An induction motor comprising a stator having a stator core applied with a winding for generating a rotating magnetic field, and a rotor opposing the stator with a predetermined gap therebetween and rotating under the influence of the rotating magnetic field generated by the stator, said rotor including a core fitted to a rotor shaft and a cylindrical member covering the circumferential surface of the core, said cylindrical member being formed with a plurality of slits, each of said slits being elongated axially and extending through the cylindrical member in a radial direction thereof to the circumferential surface of said core.

4,409,507
DYNAMOELECTRIC MACHINES FOR MULTIPLES OF THREE PHASES WITH UNBALANCED FRACTIONAL-SLOT WINDINGS

Gurney L. Godwin, Georgetown, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 28, 1982, Ser. No. 392,427
Int. Cl.³ H02K *23/34*
U.S. Cl. 310—205 **6 Claims**



1. An AC dynamoelectric machine comprising:

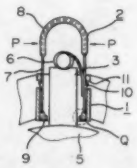
an AC winding configured for M phases, where M is an integral multiple of three, disposed in a core having uniformly spaced coil slots numbering Q and a number of electrical poles P where the number of coil slots per phase (Q/M) is an integer, and the number of coil slots per phase per pole (Q/M/P) is a non-integer expressible as a simple fraction having a numerator N and a denominator D, where D is two or more and M and D have a common factor of at least two;

said winding comprising a plurality of coils of one or more turns, each of which has two coil sides respectively disposed in two of said coil slots, and selected numbers of said coils are connected into coil groups of which some are of unequal numbers of coils, where the number of successive poles whose coil groups for the M phases are a distinct repeatable pattern for the total winding is D, and D times X, where X is an integer, equals P, and the number of individual coils within the coil groups for each individual phase within said D pole windings is N.

4,409,508
BRUSH HOLDER WITH COATED CLAMP FOR DYNAMO-ELECTRIC MACHINE

Norihiro Ooki, Katsuta; Noriyoshi Takahashi, Hitachi; Yasuyuki Wachi, Takahagi; Yoshio Takikawa, Hitachi; Norio Yamakawa, Ibaraki, and Shoji Motegi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,102
Claims priority, application Japan, May 11, 1981, 56-69415
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—239 **7 Claims**

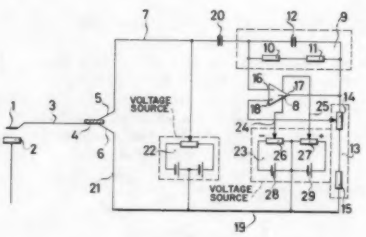


1. A brush holder for detachably holding a brush adapted to slide on the surface of a rotary electricity collector of a dynamo-electric machine, said brush holder having a stationary holder part stationarily fixed to the stationary part of said dynamo-electric machine, and a detachable holder part detachably secured to said stationary holder part for holding the brush after separation from said stationary holder part, said detachable holder part being provided with a retainer for clamping and retaining said brush when separated from said stationary holder part and for releasing said brush when attached to said stationary holder part, said retainer being constructed so as to be disposed near the sliding surface of the brush when the detachable holder part is secured to the stationary holder part, characterized by comprising a coating film coating the entire surface of the brush clamping portion and thereabout of said retainer and made of an electrically insulating material having a coefficient of friction smaller than that of the material of said retainer, whereby undesirable accumulations of powders on said retainer are avoided.

4,409,509
PIEZOELECTRICALLY DRIVEN TRANSDUCER FOR ELECTRON WORK FUNCTION AND CONTACT POTENTIAL MEASUREMENTS

Karl-Heinz Besocke, Jülich, and Siegfried Berger, Titz-Rödingen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,233
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3034390
Int. Cl.³ H01L *41/10*
U.S. Cl. 310—317 **3 Claims**



1. A piezoelectric transducer apparatus for measuring contact potentials between relatively movable electrodes and electron work function of surfaces and for atomar molecular and optical chopper applications, said apparatus having a piezoelectrically driven movable electrode and a counter-electrode, means for providing an oscillatory driving voltage for said movable electrodes, spring means for mounting said movable electrode and means for providing a controllable voltage superimposed on said oscillatory driving voltage for variation of the means spacing between said movable electrode and said counter-electrode, said movable electrode having first and second poles respectively on opposite sides of a position of said movable electrode to which said oscillatory driving voltage means provides said voltage to said movable electrode,

said means for providing oscillatory driving voltage including a self excited oscillation generator circuit (**8, 9, 13**), having a reference or ground potential conductor (**19**), said apparatus further comprising

a capacitor (**20**) connected between said first pole (**5**) of a piezoelectric driving element (**4**) of said movable electrode and said oscillation generator circuit;

a connection between said second pole (**6**) of said piezoelectric element and said reference or ground potential conductor;

connection means for applying said controllable voltage in parallel to said poles (**5, 6**) of said piezoelectric element, and

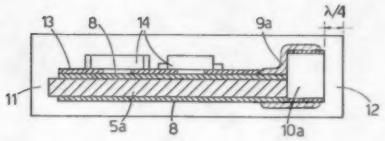
an amplitude control circuit (**26, 27, 28, 29**) for varying the amplitude of said oscillatory driving voltage.

4,409,510

METHOD FOR PROVIDING ULTRAACOUSTIC TRANSDUCERS OF THE LINE CURTAIN OR POINT MATRIX TYPE AND TRANSDUCERS OBTAINED THEREFROM

Donello Assenza, and Massimo Pappalardo, both of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Division of Ser. No. 157,281, Jun. 6, 1980, Pat. No. 4,370,785. This application Oct. 14, 1982, Ser. No. 434,355
Claims priority, application Italy, Jun. 22, 1979, 49520 A/79
Int. Cl.³ H01L 41/08
U.S. Cl. 310—334 13 Claims



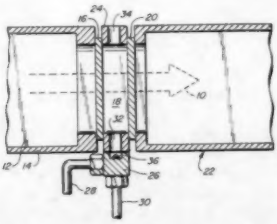
1. An ultraacoustic line curtain or point matrix transducer, characterized by a piezoelectric bar (10) having width and thickness almost equal to each other and provided with four faces (1, 2, 3, 4,) two of which (2, 4) are metalized, a substrate (5) connected with one (3) of both non-metalized faces of the piezoelectric bar (10) and provided with at least a metallic electrode (8) deposited on both opposite faces (6, 7) thereof, which are normal to the face connected with said one (3) of both non-metalized faces of the piezoelectric bar (10), said electrode (8) being connected with the metalized faces (2, 4) of the bar (10) by a layer (9) of conductive epoxy resin, and an external coating jacket (11) of epoxy resin which encloses completely the bar (10) and the substrate (5) with the electrodes (8).

4,409,511

PHASE TRANSITION COOLED WINDOW FOR BROAD BEAM ELECTRON GUN

Gary K. Loda, Danville, and Sherman R. Farrell, Orinda, both of Calif., assignors to RPC Industries, Hayward, Calif.

Filed Feb. 23, 1981, Ser. No. 236,808
Int. Cl.³ H01J 7/28
U.S. Cl. 313—34 27 Claims



1. Apparatus for cooling a charged-particle-transparent window of the type used in combination with a charged particle accelerator system, the cooling apparatus comprising:

means for supplying a vaporizable, liquid coolant material;

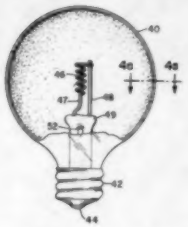
means for atomizing the liquid coolant material and for directing the atomized material onto the window whereby when the window is heated by the charged particles, the atomized material absorbs heat from the window as at least some of the material changes from a liquid to a gaseous state.

4,409,512

INCANDESCENT ELECTRIC LAMP WITH ETALON TYPE TRANSPARENT HEAT MIRROR

Peter Walsh, Stirling, N.J., assignor to Duro-Test Corporation, North Bergen, N.J.

Continuation of Ser. No. 45,645, Jun. 5, 1979, which is a continuation of Ser. No. 863,155, Dec. 22, 1977, abandoned. This application Aug. 11, 1981, Ser. No. 291,941
Int. Cl.³ H01J 5/16, 61/40; H01K 1/26, 1/30
U.S. Cl. 313—113 14 Claims



1. An incandescent electric lamp comprising

a sealed envelope of a material which is transparent to light in the visible range,

an incandescent filament within said envelope,

means for supplying electrical current to said filament to cause it to incandesce at a temperature so as to produce light energy in at least a portion of the visible range and energy in the infrared range,

the major portion of said envelope being optically shaped with a curved surface curved in at least two directions in any given area to reflect energy back toward and to impinge upon said filament, an etalon coating located directly on a substantial part of the curved surface portion of the envelope, said coating comprising only a single triad of films consisting of a film of a dielectric material sandwiched between and in direct contact with two films of an electrically conductive metal with one of said films of electrically conductive metal being deposited directly on the envelope, said films being matched to the characteristics of both the visible range light energy and the infrared range energy produced by the filament for transmitting exterior to the lamp at least about 80% of the visible range light energy at the peak of the luminosity curve of the visible range light energy produced by the filament and for reflecting at least about 75% of the energy in the infrared range at about 1.0 micron and above back towards the filament to impinge thereon to thereby increase the operating temperature of the filament and to reduce the amount of electrical current needed to heat said filament to incandescence.

4,409,513

ELECTRODE FOR AN ELECTRON GUN

Ralph J. D'Amato, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 145,237, Apr. 3, 1980, Pat. No. 4,318,026. This application Oct. 5, 1981, Ser. No. 308,841
Int. Cl.³ H01J 1/46, 17/04, 19/38, 19/40
U.S. Cl. 313—348 5 Claims

1. In an electron gun comprising a cathode and a plurality of electrodes spaced therefrom, the improvement wherein said electrode adjacent to said cathode comprises

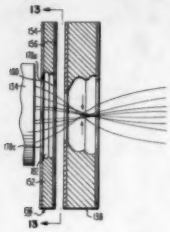
an electrically conductive base member of a first material having an aperture extending therethrough, said base member having two opposing surfaces, and

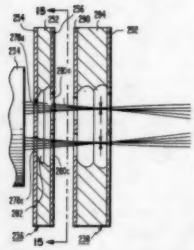
overlying layers of a second electrically conductive material disposed on said opposing surfaces of said base member, said overlying layers overhanging said aperture in said

base member, said overlying layer proximate to said cathode having a plurality of beam forming apertures therethrough which communicate with said aperture in said base member for forming a plurality of beam bundles which originate from isolated areas on said cathode.

5. In an electron gun comprising a cathode and a plurality of electrodes spaced therefrom, the improvement wherein the electrode adjacent to said cathode comprises

an electrically conductive base member of a first material having an aperture extending therethrough, said base member having two opposing surfaces, and





overlying layers of a second electrically conductive material disposed on said opposing surfaces of said base member overhanging said aperture therein, said overlying layer proximate to said cathode having a plurality of beam forming apertures therethrough and said overlying layer remote from said cathode having a like plurality of beam forming apertures therethrough, said apertures in said remote layer being aligned with said apertures in said proximate layer, said apertures in said proximate layer and in said remote layer communicating with said aperture in said base member for forming a plurality of electron beams which originate from isolated areas of said cathode.

4,409,514

ELECTRON GUN WITH IMPROVED BEAM FORMING REGION

Joshua Shefer, Princeton, and Carmen A. Catanese, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

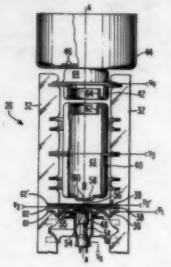
Filed Apr. 29, 1981, Ser. No. 258,805

Int. Cl.³ H01J *29/48*

U.S. Cl. 313—449 **16 Claims**

1. In an electron gun for use in a cathode ray tube, said gun including beam forming electrodes and beam focusing electrodes, the improvement comprising

said beam forming electrodes including a cathode, a control grid adjacent to said cathode and two screen grids, a first of said screen grids being adjacent to a side of said control grid opposite said cathode and a second screen grid being between said first screen grid and said beam focusing



electrodes, and said second screen grid and said control grid being electrically connected.

4,409,515

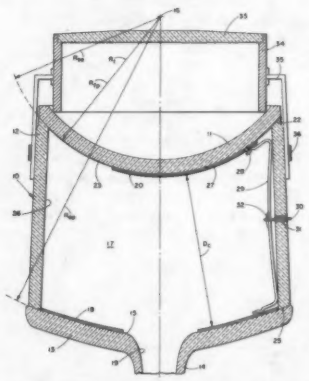
PROJECTION TELEVISION TUBE AND PROCESS FOR FORMING SAME

Henry E. Kloss, 174 Brattle St., Cambridge, Mass. 02133

Continuation of Ser. No. 12,714, Feb. 16, 1979, which is a division of Ser. No. 875,222, Feb. 6, 1978, abandoned. This application Jul. 24, 1981, Ser. No. 286,711

Int. Cl.³ H01J *31/00, 31/10*

U.S. Cl. 313—477 R **8 Claims**



1. A projection television tube comprising:

a neck;

an end plate sealed to the neck and having an internal reflective surface lying on a spherical surface having a center of curvature located forwardly of the end plate along the projection axis of the tube and an end plate peripheral area including a sealing surface lying on a spherical surface concentric with said reflective surface;

an electron beam target surface spaced forwardly of said end plate and lying on a spherical surface concentric with said reflective surface and located on the same side of said center of curvature as said reflective surface, said target surface intersecting the projection axis of the tube;

a target support having a target support peripheral edge sealing area lying on a spherical surface that is concentric with said target surface, said target support being located between said target surface and said center of curvature, and intersecting the projection axis of the tube, said target

support also comprising an imperforate face plate for the envelope;

said target surface being secured to said target support;

a hollow cylindrical member of predetermined length extending between said end plate peripheral area and said peripheral edge sealing area of said target support, said cylindrical member having an axis of symmetry coextensive with said projection axis, and including opposite sealing end surfaces concentric with said reflective surface;

said cylindrical member and said target support peripheral edge sealing area being joined along a joint interface surface area lying on a spherical surface that is concentric with said reflective and target surfaces;

said cylindrical member and said end plate sealing surface also being joined along a joint interface surface area lying on a spherical surface that is concentric with said reflective and target surfaces;

said end plate, target support and cylindrical member being respectively bonded together along their mutual joint interface areas in sealed relationship;

an electron gun means sealed within said neck and arranged to produce an electron beam to print a raster on said target surface;

an electron beam focusing means; and

an electrical connection between said target surface and said reflective surface.

4,409,516

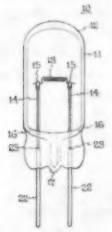
ROUNDED END HALOGEN LAMP WITH EXHAUST TUBE HAVING DIFFERENT GLASS

George L. Thomas, Chesterland, and William A. Graff, Willoughby, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 22, 1981, Ser. No. 227,224

Int. Cl.³ H01K 1/22

U.S. Cl. 313—579 **6 Claims**



1. An improved incandescent lamp comprising an envelope of a first high temperature aluminosilicate glass exhibiting a sealing temperature not exceeding about 1450° C. comprising in approximate weight percent 54–71 SiO_2, 12–18 Al_2O_3, 4–8 CaO, 10–23 BaO, and 0–3 R_2O, wherein R is an alkali metal ion, along with minor amounts of incidental impurities, residual fluxes and refining agents, such that the aggregate SiO_2 and Al_2O_3 content lies within the approximate range 73–83 weight percent, the aggregate BaO and CaO content lies within the approximate range 17–30 weight percent and the ratio between BaO weight percent and CaO weight percent lies within the approximate range 2.3 to 3.5, said envelope also having a rounded end, refractory metal lead-in wires hermetically sealed into said envelope at one end of said envelope opposite said rounded end, a tungsten filament connected at each end to said lead-in wires, said envelope containing the tipped-off residue of an exhaust tube prepared from a second different higher temperature aluminosilicate glass located at the end of the envelope opposite the rounded end and exhibiting a higher sealing temperature of about 1500° C., with said different higher temperature aluminosilicate glass comprising in approximate weight percent 56–63 SiO_2, 13–17 Al_2O_3, 19–24 BaO, 1–4.5 CaO, and 0–3 R_2O, wherein R is an alkali metal ion, along with minor amounts of incidental impurities, residual fluxes and fining agents, such that the aggregate BaO and CaO content lies within the approximate range 21–26 weight percent and the ratio between BaO weight percent and CaO weight percent exceeds 4.7, and a filling within said envelope containing an inert gas and a halogen, wherein the improvement comprises having said exhaust tube devoid of any conventional refractory metal spiral.

4,409,517

HIGH-PRESSURE DISCHARGE LAMP WITH ENVELOPE LEAD-THROUGH STRUCTURE

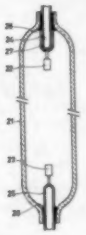
Johannes H. M. Van Der Sande; Franciscus G. P. Sools, both of Eindhoven, Netherlands, and Ronald J. Campbell, Pennington, N.J., assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,746

Claims priority, application Netherlands, Jun. 3, 1980, 8003216

Int. Cl.³ H01J 61/12, 61/36

U.S. Cl. 313—631 **5 Claims**



1. A high-pressure discharge lamp for use in the vertical position having a ceramic tubular discharge vessel which is sealed in a vacuum-tight manner, the longitudinal axis of which does not deviate by more than 45° from the vertical in use, the discharge vessel containing a gas filling containing a halogen and/or halide, respective electrodes disposed at the ends of the discharge vessel, the discharge being maintained between these electrodes during operation of the lamp, each electrode being connected to a current lead-through member included in the discharge vessel wall, the current lead-through member located at the upper end of the discharge vessel consists at least at its surface facing the discharge, of a material which is resistant to attack by halogens and/or halides, and that the current lead-through member located at the other, lower end of the discharge vessel contains a material which is highly permeable to hydrogen and which would be attacked by a halogen and/or a halide if used at the upper end.

4,409,518

TWT INTERACTION CIRCUIT WITH BROAD LADDER RUNGS

Arthur Karp, Palo Alto, Calif., and Gary A. Biggs, Sandy, Utah, assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 29, 1981, Ser. No. 287,954

Int. Cl.³ H01J 25/34

U.S. Cl. 315—3.5 **13 Claims**

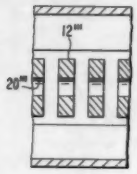
1. A slow wave circuit comprising:

a conductive envelope extended in an axial direction, and defining interior walls;

an array of parallel conductive rungs spaced along the length of said envelope, each rung connected only at its ends to said envelope at opposite ones of said interior walls;

the improvement wherein at least a remaining one of said

interior walls of said envelope is shaped so that the spacing between said remaining wall and each said rung near at least one of said rung ends is smaller than the spacing between said wall and rung near the middle of each said rung, and the breadth of at least a portion of said rungs, in a direction perpendicular to the length of said rungs and to



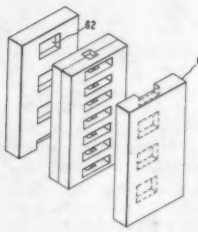
said axial direction is greater than one-half the length of said rungs, whereby the fundamental wave of said lowest passband is a backward wave, and the upper cutoff frequency of the lowest passband of said circuit corresponds to a pole of the impedance of said circuit in said axial direction.

4,409,519

TWT SLOW-WAVE STRUCTURE ASSEMBLED FROM THREE LADDER-LIKE SLABS

Arthur Karp, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 29, 1981, Ser. No. 287,953
Int. Cl.³ H01J *25/34*
U.S. Cl. 315—3.5 **5 Claims**



1. A slow wave circuit comprising:

a first unitary elongated metallic ladder-like interaction element, said element including a pair of parallel spaced axially-extending longitudinal members, and an array of rung members connecting said longitudinal members;

said longitudinal and rung members defining apertures in said element, said apertures being spaced from each other by a periodic pitch;

a pair of unitary elongated metallic side coupling elements, each having an array of axially extending recesses, said recesses being spaced from each other by twice said periodic pitch;

said pair of side elements being bonded to opposite sides of said interaction element such that each of said recesses bridges two successive apertures of said interaction element;

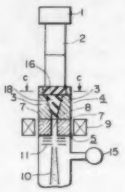
said recesses in one of said side elements being axially offset by said pitch with respect to said recesses in the other of said side elements, such that successive apertures are connected via said recesses on alternating sides of said apertures.

4,409,520

MICROWAVE DISCHARGE ION SOURCE

Hidemi Koike, Tokorozawa; Noriyuki Sakudo, Ohme; Katsumi Tokiguchi, Hachioji, and Ichiro Kanomata, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,072
Claims priority, application Japan, Mar. 24, 1980, 55-36074
Int. Cl.³ H01J *7/46, 19/80*
U.S. Cl. 315—39 **8 Claims**



1. A microwave discharge ion source comprising means for generating microwaves, a discharge chamber which has ridged electrodes for introducing the microwaves generated by the microwave generating means and establishing a microwave electric field and which is maintained in a vacuum state, and a waveguide which guides said microwaves generated by said microwave generating means to said discharge chamber; said waveguide consisting of a section which has no ridged electrode and which serves to guide said microwaves generated by said microwave generating means to said discharge chamber without reflecting them, and a section which has ridged electrodes; a vacuum-sealing dielectric plate being disposed in said section of said waveguide having no ridged electrode, said vacuum-sealing dielectric plate serving to maintain the vacuum state of said discharge chamber and also to propagate said microwaves without reflecting them; an insulating packed material being packed in a space in said waveguide existent between said vacuum-sealing dielectric plate and said discharge chamber, said insulating packed material serving to prevent any discharge outside said discharge chamber.

4,409,521

FLUORESCENT LAMP WITH REDUCED ELECTROMAGNETIC INTERFERENCE

Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

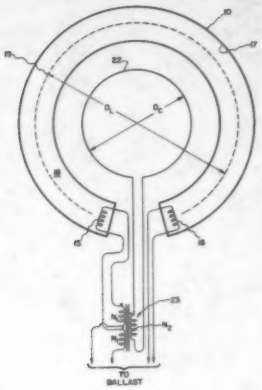
Continuation of Ser. No. 104,422, Dec. 17, 1979, abandoned.
This application Jun. 25, 1981, Ser. No. 277,422
Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—57 **16 Claims**

1. An arc discharge device comprising:

an elongate evacuable envelope having electrodes disposed within said envelope at opposite ends thereof, said envelope containing an ionizable discharge medium, said discharge device operating by the conduction of alternating current between said electrodes through said medium; and

electromagnetic radiation reduction means external to said envelope, said means providing a conductive current path in which the direction of current flow is opposite to the

direction of current flow within said envelope so as to produce a magnetic field which generally opposes the



magnetic field produced by the discharge current flow between said electrodes.

4,409,522

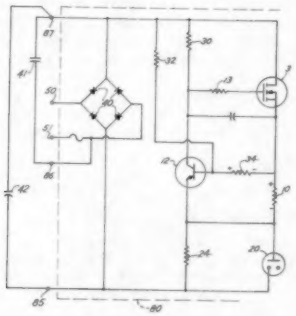
DIRECT CURRENT POWER SOURCE FOR AN ELECTRIC DISCHARGE LAMP USING REDUCED STARTING CURRENT

William J. Elliott, Zephyr Cove, Nev., assignor to Quietlite International, Inc., Reno, Nev.

Filed Aug. 28, 1981, Ser. No. 297,146

Int. Cl.³ G05F *1/00*; H05B *37/02*

U.S. Cl. 315—308 **10 Claims**



1. A power supply for an electric discharge lamp comprising, in combination,

a source of a direct current potential,

current sensing means,

at least one power transistor having a transconductive path and a control electrode, said transconductive path(s), said lamp, and said current sensing means being connected in series across said source,

means responsive to said current sensing means for maintaining the magnitude of current flowing through said lamp at a regulated level, and

means responsive to the voltage across said transconductive path(s) for increasing the magnitude of said regulated level as said voltage decreases during initial lamp warmup.

4,409,523

PINCUSHION DISTORTION CORRECTION APPARATUS

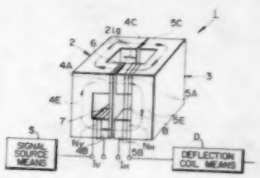
Masayuki Yasumura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,677

Claims priority, application Japan, Jan. 31, 1980, 55-10700

Int. Cl.³ H01J *29/70, 29/56*

U.S. Cl. 315—371 **6 Claims**



1. A pincushion distortion correction apparatus for television receivers comprising;

a saturable transformer including a ferromagnetic core forming a cubic magnetic loop path structure, said ferromagnetic core consisting of two ferromagnetic core pieces having four legs and two common portions, a controlled winding wound on the first and second ones of said four legs of the core, a control winding wound on the second and third ones of said four legs of the core, and a space gap means provided between said two ferromagnetic core pieces;

a deflection coil being connected in series with said controlled winding; and

a signal source for supplying a control parabolic signal to said control winding.

4,409,524

ARRANGEMENT FOR CONTROLLING THE DRIVING AND BRAKING CURRENT OF A BRUSHLESS D.C. MOTOR

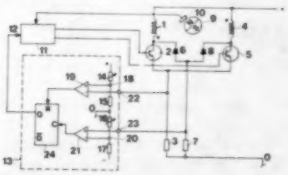
Henrik B. Nielsen, Nordborg, and Nils H. Nygaard, Rodding, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 20, 1980, Ser. No. 208,529

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949017

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—138 **5 Claims**



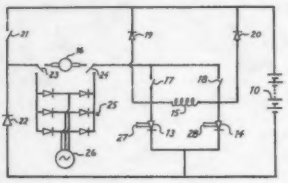
1. A control circuit for a brushless DC motor having a permanent magnet rotor and first and second stator windings, comprising, first and second semiconductor switching elements in respective series with said windings, said windings being double wound on the core of said stator, the core of said stator, first and second free wheeling diodes connected respectively to the junctions of said windings and said switching elements in oppositely poled relation to said switching elements, scanning circuit commutating means for alternately switching said elements on and off in accordance with the rotary position of said rotor, first and second current measuring means in respective series relation to said switching ele-

ments and said diodes, and comparator means responsive to said current measuring means for alternately blocking and unblocking the output of said scanning circuit commutating means when said first and second current measuring means reach predetermined values.

4,409,525
VEHICLE

Carl S. M. Hartwig, Täby, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jul. 15, 1981, Ser. No. 283,517
Claims priority, application Sweden, Aug. 14, 1980, 8005729
Int. Cl.³ H02J 7/00
U.S. Cl. 318—139 **4 Claims**

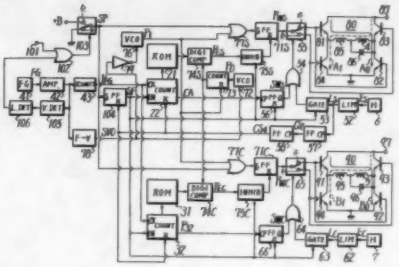


1. A vehicle operated by electric battery power comprising:
a DC electric traction motor (11) having an armature (16) and a field winding (15);
a battery (10) chargeable from an external power source (26) separate from the vehicle; and
a battery charging and motor drive controlling circuit comprising:
a chopper-controller being operable in a drive mode for coupling said motor to said battery (10) for controlling the motor speed and for selectively operating in an external charge mode for coupling said battery (10) to said external power source (26) for controlling the supply of battery charging energy to said battery (10) from said external source (26);
said chopper-controller being also operable in a regenerative braking mode and includes means coupled to said field winding (15) of said motor for causing said motor to carry out regenerative braking of the vehicle when in said regenerative braking mode;
said chopper-controller including replacing means coupled to said armature (16) and to said external power source (26) for replacing said armature (16) with said external power source (26) when in said external charge mode;
a diode-bridge rectifier means (25) coupling said external power source (26) to said replacing means;
said chopper-controller operating in said regenerative braking mode when said battery (10) is charged from said external source (26); and
said chopper-controller further comprising a first circuit including a series circuit of a forced-commutated thyristor (14), a first diode means (22) and the traction motor (11); whereby when said copper-controller is in said regenerative braking mode, said first circuit builds up charging energy in said field winding (15) of the motor (11) which energy is supplied to said battery (10) by said second circuit for charging said battery (10) during said regenerative braking mode.

4,409,526
BRUSHLESS DC MOTOR

Hiroyuki Yamauchi, Saitama, and Tamotsu Yamagami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1980, Ser. No. 209,145
Claims priority, application Japan, Nov. 22, 1979, 54-151433
Int. Cl.³ H02K 29/00
U.S. Cl. 318—254 **29 Claims**



1. In a brushless DC motor comprising a rotor having an axis of rotation and including rotor magnet means establishing a sinusoidal magnetic field along a circular line concentric with said axis, and a stator including two-phase stator windings spaced from each other by an electrical angle which is an odd multiple of 90°, said rotor and stator being mounted for relative rotation about said axis with said stator windings confronting said rotor magnet means across said line so as to be affected by said sinusoidal magnetic field;
a drive circuit including signal generating means providing an output with a frequency determined by the speed of said relative rotation, memory means for storing information data representing respective sampled values of predetermined sinusoidal waveforms, means responsive to said output of the signal generating means for reading out said information data from said memory means, means for synchronizing said reading out of the information data with the affect of said sinusoidal magnetic field on said stator windings, means for providing electrical currents through said stator windings which co-act with said magnetic field to produce torque for effecting said relative rotation, and means responsive to said information data read out of the memory means for controlling said electrical currents so as to substantially eliminate ripple from said torque.

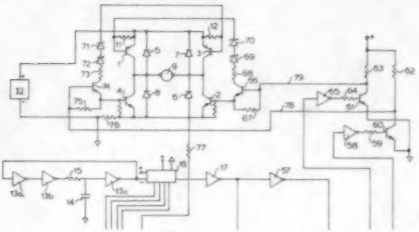
4,409,527
TRANSISTOR MOTOR CONTROL

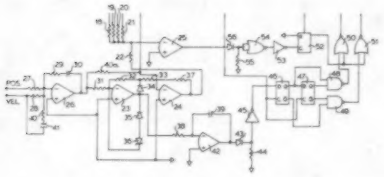
Marcel R. Sommeria, P.O. Box 371, Palos Heights, Ill. 60463

Continuation of Ser. No. 54,419, Jul. 3, 1979, abandoned. This application Aug. 12, 1981, Ser. No. 292,161
Int. Cl.³ H02P 5/06
U.S. Cl. 318—341 **3 Claims**

1. A digital motor control circuit for a DC motor, including means for generating an analog feedback signal indicative of the speed of said motor; comprising a plurality of driving elements connected in two groups, a power supply, a first of said groups being connected to supply current from said power supply to said motor for powering the motor in a forward direction, and the other group being connected to supply current from said power supply to said motor for powering the motor in the reverse direction, a source of clock pulses, a digital counter connected to said source of clock pulses and operative continuously, a digital-to-analog converter connected to said counter for connecting a stair-step waveform having levels corresponding to the state of said counter, comparator means connected to said digital-to-analog converter for comparing said analog feedback signal indicative of the

speed of said motor with said stair-step waveform, means connected to said comparator means for deriving a pulse width modulated signal consisting of pulses having leading and trailing edges, one edge of each of said pulses being established in response to a comparison between said stair-step waveform and said feedback signal, and the other edge being established at the beginning of each cycle of said stair-step waveform, means connected to receive said pulse width modulated waveform for controlling one or the other group of said driving





elements for at least one cycle of operation of said counter coincident with each change in sign, a precision rectifier for providing an amplified signal corresponding to the absolute value of said feedback signal, said rectifier including an inverting amplifier having an input resistor and two parallel feedback circuits, one feedback circuit having a diode poled relative to the output terminals of said amplifier in one direction and having a resistor equal to said input resistor for establishing unity gain in one mode of operation of said amplifier, and the other feedback circuit having a diode poled in the opposite direction and a zener diode for determining the output voltage of said amplifier in another mode of operation of said amplifier, and means connected to the output of said amplifier to receive said sign signal.

4,409,528

MOTOR SPEED CONTROL CIRCUIT PROVIDING ARMATURE CURRENT SENSING AND FEEDBACK ACTION FOR EACH HALF CYCLE AND CONTROL CIRCUIT REDUCING ENERGY CONSUMPTION OF INDUCTION MOTORS WHEN RUNNING UNDER NO LOAD AND LIGHT LOADING

Allen F. Podell, Palo Alto, Calif., assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Jun. 13, 1980, Ser. No. 159,136

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—345 D **12 Claims**

1. A motor speed control circuit for supplying electrical power to a motor during both positive and negative half cycles of an alternating current supply voltage in which power is automatically varied as the load on the motor varies at any given speed setting in order to maintain the motor speed substantially constant at that speed setting under variable load conditions, said motor speed control circuit comprising:

a pair of terminals adapted for connection to an electric motor of the universal type having an armature winding and a commutator,

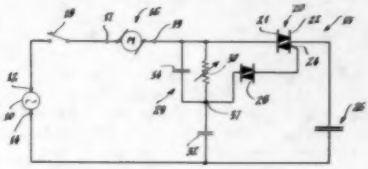
a triac having first and second electrodes and a control electrode,

a pair of alternating current (AC) supply terminals,

a capacitor of relatively large capacitance value of the non-polar type having a capacitance in the range of 500 to 1,000 microFarads per ampere of peak motor current when the motor is operating under full rated load at full speed setting,

said pair of supply terminals, said motor terminals, said first and second electrodes of said triac and said capacitor being connected in a series circuit,

a phase-shifting trigger circuit having a speed-control variable resistor, said trigger circuit being connected across said series circuit, with said trigger circuit being con-



nected to said control electrode of said triac for adjusting the desired speed of the motor by adjusting said variable resistor for adjusting the firing angle of said triac,

by virtue of said capacitor being in said series circuit with the motor and the triac, the charging voltage occurring on the capacitor during each half cycle of the AC supply voltage is a function of the current flowing through the armature winding which in turn is a function of the torque load being imposed on the motor at that moment,

whereby the magnitude of said charging voltage occurring on said capacitor during each half cycle automatically changes the firing angle of the triac at a given setting of said variable resistor during each succeeding half cycle for increasing the power to the motor when the torque load has increased and for decreasing the power to the motor when the torque load has decreased,

thereby to maintain the motor speed substantially constant at any given speed setting of said variable resistor over a relatively wide range of torque loading on the motor.

4,409,529

PROSTHESIS

Robert Basford, Fetcham; David Hart, Keighley; David Hawkins, Bifleet; David Knight, Worcester Park, and Roger Sidey, Richmond, all of England, assignors to Hugh Steeper Limited, London, England

Filed Mar. 24, 1981, Ser. No. 247,117

Claims priority, application United Kingdom, Mar. 24, 1980, 8009850; Sep. 23, 1980, 8030680

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—653 **23 Claims**

1. A prosthesis comprising:

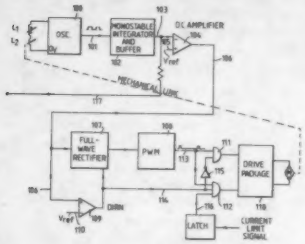
(a) a gripping member;

(b) an operating lever mounted to pivot about a pivot axis and operatively connected to the gripping member;

(c) a power unit including an electric motor, and a drive shaft rotatable by said electric motor;

(d) means connecting the drive shaft to the operating lever at a region spaced from the said pivot axis of the operating lever, said connecting means being constructed so that when the drive shaft rotates the connecting means (and also the region of the operating lever connected to the

shaft) travels axially along the shaft thereby causing the operating lever to pivot about its pivot axis; and



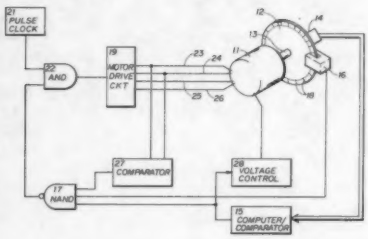
(e) means pivotally mounting said power unit to allow the connecting means to move along an arcuate path about the pivot axis during pivoting of the operating lever.

4,409,530

METHOD AND APPARATUS FOR STEPPER MOTOR POSITION CONTROL

Robert K. Neeper, Yorba Linda, and Richard C. Meyer, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 10, 1980, Ser. No. 205,114
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—685 **2 Claims**



1. Apparatus for positioning a turntable comprising:
a four winding stepping motor coupled with said turntable;
means, connected to said four windings, for energizing said four windings;
a NAND gate connected to said energizing means;
an optical sensor, associated with said turntable and connected to said NAND gate;
a position encoder, associated with said turntable and connected to said NAND gate; and
a comparator, connected to at least two of said windings and to said NAND gate.

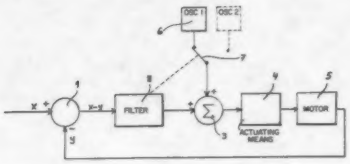
4,409,531

METHOD AND A DEVICE FOR INCREASING THE LINEARITY OF A SERVO SYSTEM

Lennart Bjurström, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 1, 1980, Ser. No. 192,659
Claims priority, application Sweden, Oct. 2, 1979, 7908149
Int. Cl.³ F41G *5/06;* **G05B** *13/00*
U.S. Cl. 318—631 **4 Claims**

1. In a closed loop servo system, wherein a command signal and position signal are compared forming an error signal serving as a control signal reducing said error signal, said system having a bandwidth with an upper frequency limit, an apparatus for increasing the accuracy and response linearity of said servo system comprising:
one or more integrating second order filter networks for filtering said control signal;
a dither frequency generator for producing a dither signal at a frequency substantially the same as said upper frequency limit; and



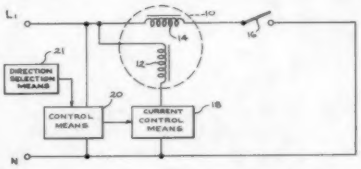
switching means for inserting said second order filter networks in said servo system to filter said control signal and for applying said dither signal to said control signal during small position errors, whereby overall servo system response linearity is improved by said dither signal.

4,409,532

START CONTROL ARRANGEMENT FOR SPLIT PHASE INDUCTION MOTOR

Robert K. Hollenbeck, and Jimmy R. Rickard, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 6, 1981, Ser. No. 318,717
Int. Cl.³ H02P *3/20, 1/24*
U.S. Cl. 318—749 **18 Claims**



1. A start control arrangement for a reversible alternating current split phase induction motor having a run winding electrically connected in parallel with a start winding adapted for energization by a voltage signal from an external alternating current power supply, said start control arrangement being effective to selectively initiate motor rotation in one direction or the other, said start control arrangement comprising:
selection means for selecting rotation of the motor in one direction or the other;
current control means for connection in series with the start winding of the motor having a conductive state and a non-conductive state and operative when conductive to pass current from the power supply to the start winding and when non-conductive to prevent current from flowing in the start winding; and
control means comprising:
voltage sensing means for detecting zero crossings of the voltage signal from the external supply;
timing means operative to sense the elapsed time from the preceding zero crossing; and
start control means responsive to said timing means and said selection means operative to render said current control means conductive for a first predetermined portion of each half-cycle of the voltage signal when rotation in said one direction is selected, thereby initiating motor rotation in said one direction and to render said current control means conductive for a second predetermined portion of each half-cycle when rotation

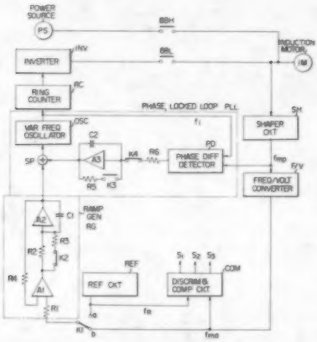
in said other direction is selected, thereby initiating motor rotation in said other direction.

4,409,533

METHOD OF RESTARTING INDUCTION MOTOR AND APPARATUS FOR CARRYING OUT THE SAME

Takao Kawabata, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 55,192
Claims priority, application Japan, Jun. 30, 1978, 53-80349
Int. Cl.³ H02P 1/42
U.S. Cl. 318—807 **5 Claims**



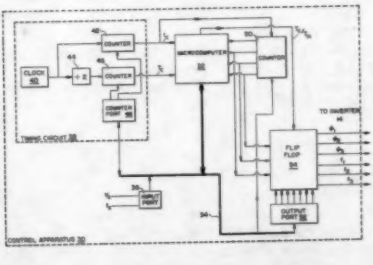
1. A method of restarting an induction motor in the decelerating mode by a variable frequency electric source, comprising the steps of detecting a residual electromotive force across said induction motor, synchronizing the frequency of said variable frequency electric source with the frequency of said residual electromotive force to thereby supply electric power to said induction motor from said variable frequency source while maintaining the frequency of said variable frequency electric source in synchronism with the speed of said induction motor, and then changing said frequency of said variable frequency electric source to a predetermined value to thereby place said induction motor in a predetermined operating state.

4,409,534

MICROCOMPUTER-BASED PULSE WIDTH MODULATED INVERTER FED MACHINE DRIVE SYSTEM

Bimal K. Bose, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 138,537, Apr. 9, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 328,164
Int. Cl.³ H02P 5/40, 7/44, 7/58
U.S. Cl. 318—811 **5 Claims**



1. For use with a pulse width modulated inverter fed machine drive system comprised of a polyphase alternating current machine excited from a direct current voltage source through an inverter configured of a plurality of pairs of controlled switching devices, each of the controlled switching devices of each pair coupled in series aiding fashion and each of the pairs of controlled switching devices, respectively, coupled across the direct current source and coupled at the junction between switching devices of each pair to a separate one of the phases of the polyphase alternating current machine, an improved control apparatus for regulating the conduction frequency and conduction duration of inverter controlled switching devices to regulate machine speed and torque, comprising:

timing circuit means for generating a first interrupt signal at a frequency varying in accordance with an operator-command frequency and generating a second interrupt signal at a frequency proportional to the frequency of said first interrupt signal:

said timing circuit comprising,

a clock for generating a clock signal at periodic intervals, a counter port for storing a first word proportional in length to the desired duration between successive occurrences of said first interrupt signal and storing a second word proportional in length to the desired duration between successive occurrences of said second interrupt signal; a first counter coupled to said counter port and to said clock, said first counter receiving said first word from said counter port and decrementing said first word from said counter port and decrementing said first word by a fixed amount upon receipt of a clock signal from said clock and when said first word is completely decremented, said first counter generating said first interrupt signal; a logic gate coupled to said clock for generating periodic pulses at a frequency twice the frequency of said clock signals; and a second counter coupled to said counter port and to said logic gate, said second counter receiving said second word from said counter port and decrementing said second word by a fixed amount upon each receipt of a signal from said logic gate, and when said second word is completely decremented, said second counter producing said second interrupt signal;

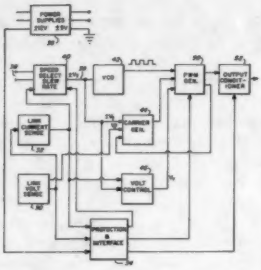
processor means coupled to said timing circuit means, said processor means being responsive to said timing circuit first and second interrupt signal and during intervals between successive occurrences of said timing circuit first interrupt signal, said processor means producing inverter pulse width modulation signal pulses and inverter half cycle polarity signal pulses to regulate the conduction duration and conduction sequence of inverter switching devices, respectively, said inverter pulse width modulation signal pulses being produced by said processor means by uniform sampling in accordance with said timing circuit means second interrupt signal when said operator-commanded frequency is below a preselected frequency and said inverter pulse width modulation signal pulse being produced by said processor means by synthesis from stored data in accordance with said timing circuit second interrupt signal when said operator-commanded frequency is above said preselected frequency; and

storage means coupled to said processor means and to said inverter for retaining said pulse width modulation signal pulses and said half cycle polarity signal pulses generated by said processing means during each interval between successive occurrences of said timing circuit first interrupt signal and during each successive interval between successive occurrences of said timing circuit first interrupt signal, said storage means releasing pulse width modulation signal pulses and half cycle polarity signal pulses stored therein during each previous interval between successive occurrences of said timing circuit first interrupt signal to said inverter.

4,409,535
GATED ASYNCHRONOUS CARRIER MODULATION

Mark R. Hickman, Westboro, Mass., assignor to Vee Arc Corporation, Westboro, Mass.

Filed Mar. 18, 1982, Ser. No. 359,615
Int. Cl.³ H02P 5/34
U.S. Cl. 318—811 10 Claims



1. Motor pulse width modulation control apparatus comprising;

means for establishing a repetitive modulation signal,

means for generating a carrier frequency signal at a frequency greater than the frequency of the modulation signal,

means for gating the carrier frequency signal at a gating rate less than the frequency of the carrier frequency signal so as to provide a gated carrier frequency signal,

and means for modulating the gated carrier frequency signal by the repetitive modulation signal so as to provide a cyclic pulse width modulation drive signal for motor control,

said means for gating the carrier frequency signal comprising means for generating, on an asynchronous basis to the modulation signal, a resetting of the carrier frequency signal whereby the carrier frequency is restarted a number of times every modulation cycle,

said carrier frequency being restarted from a fixed amplitude at each gating.

4,409,536
SUPPORT MEANS FOR PLUG-IN TRANSFORMER/CHARGER

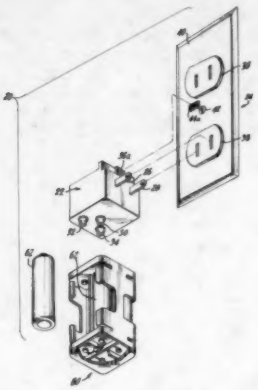
John M. Evjen, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 66,190, Aug. 13, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 302,320
Int. Cl.³ H02J 7/00
U.S. Cl. 320—2 10 Claims

1. A charging system adapted for use with a conventional outlet source, said system comprising:

(i) a charge current source including a high impedence center tapped transformer, a housing for said transformer, two blades extending from one face of the housing for engagement with the socket outlet source, and fastening means on said face of the housing; and

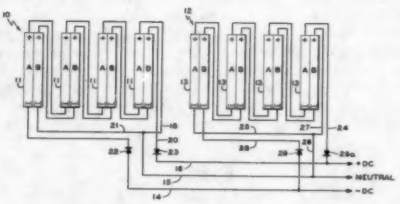
(ii) anchoring means disposed on said outlet and detachable matable with said fastening means, whereby engagement of said fastening means with said anchoring means when the charge current source is plugged into the outlet source provides auxiliary mechanical supporting for the charge current source and any associated modules, said mechanical support occurring simultaneously with the plugging in of the charge current source into the outlet source.



4,409,537
INTERCONNECTION OF PRIMARY CELLS

William A. Harris, New Brighton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1982, Ser. No. 363,982
Int. Cl.³ H01M 10/44
U.S. Cl. 320—7 17 Claims



1. A method for supplying power from at least one group of primary electric cells, said method comprising the steps of:

connecting said at least one group of primary electric cells to form two series-connected subgroups each containing one-half of the cells;

connecting said at least one group of primary electric cells to a three-conductor electric supply system having positive, negative and neutral conductors such that one of said series-connected subgroups is connected between the negative conductor and the neutral conductor and the other of said serially connected subgroups is connected between the positive conductor and the neutral conductor.

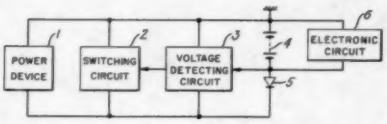
4,409,538
CHARGE CONTROL CIRCUIT

Junichi Tabata, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,345
Claims priority, application Japan, Aug. 27, 1980, 55-117885
Int. Cl.³ H01M 10/46
U.S. Cl. 320—11 2 Claims

1. A charge control circuit comprising: an excess charge detecting circuit and a charge changeover circuit of a second-

ary battery operated by an electromotive force of a power device, said excess charge detecting circuit being connected between a first line connected to both a positive terminal of said power device and a positive terminal of said secondary battery and a second line connected to a negative terminal of said power device, said excess charge detecting circuit comprising a first stage having a source of a first P channel MOSFET connected to the first line, a gate thereof connected to a negative terminal of the secondary battery and a drain thereof connected to both a drain and a gate of a first N channel MOS-



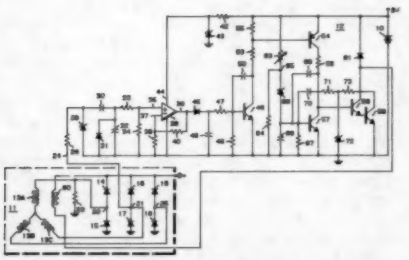
FET connected to the second line, a second stage having a source of a second N channel MOSFET connected to the second line, a gate thereof connected to the drain of the first N channel MOSFET and a drain thereof connected to the first line by way of a resistor, and a third stage having a source of a second P channel MOSFET connected to the first line, a gate thereof connected to the drain of the second N channel MOSFET, a drain thereof connected to a drain of a third N channel MOSFET, a gate of the third N channel MOSFET connected to the drain of the first N channel MOSFET and a source of the third N channel MOSFET connected to the second line.

4,409,539

SELF-EXCITATION FOR AN ALTERNATOR OF THE LOW-CARBON STEEL ROTOR TYPE

Raymond E. Nordbrock, West Chicago, and Kirk A. Sievers, Roselle, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 12, 1981, Ser. No. 242,864
Int. Cl.³ H02P *9/08*
U.S. Cl. 322—28 **6 Claims**



1. A charging system for amplifying AC output voltages induced in at least one stator winding of an alternator by residual magnetism in the alternator rotor and energizing a field winding of the alternator at low alternator rotational speeds to self-energize the charging system by means of the residual magnetism, said charging system comprising:

an alternator having at least one stator winding wound on a core, the alternator further having a field winding wound on a low carbon steel core and in operative proximity to said stator winding to provide an electromagnetic field for said stator winding;

electronic voltage regulator means having at least one input terminal coupled to said stator winding of the alternator, the electronic voltage regulator means comprising an operational amplifier having one of its input terminals coupled to the input terminal of the electronic voltage regulator means, the operational amplifier providing an amplified output AC signal at its output terminal, peak detector means coupled to the output terminal of the operational amplifier to peak detect the magnitude of the amplified AC output signal, and circuit means coupled to the peak detector means and responsive to the output of the peak detector means to develop the output signal of the electronic voltage regulator means, whereby the electronic voltage regulator means is responsive to small AC output voltages induced into the stator winding by residual magnetism during low alternator speeds, such as during start-up, to develop an output signal at an output of the electronic voltage regulator means of sufficient magnitude to fully excite the alternator field winding even when said small AC output voltages are of lower magnitude than that required to forward a silicon semiconductor junction; and

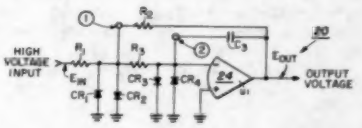
coupling means to couple the output signal of the electronic voltage regulator means to said field winding of the alternator.

4,409,540

ACTIVE VOLTAGE DIVIDER

Thaddeus M. Jones, Mishawaka, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 28, 1981, Ser. No. 305,862
Int. Cl.³ H03H *1/00*
U.S. Cl. 323—369 **10 Claims**



1. In a voltage divider circuit adapted to receive an input voltage and including a high resistance primary resistor providing a voltage drop for effecting a selected low output voltage, overload protection means operably effective on failure of said resistor to restrict increases in said output voltage, said overload protection means comprising differential amplifier means affording integrating operation and diode means effective to prevent excess voltage from being applied to summing junctions of said amplifier means.

4,409,541

METHOD OF AND APPARATUS FOR DETERMINING CONTINUITY OF AN ELECTRICAL CONDUCTOR

Raymond G. Richards, Summerside, Canada, assignor to PPG Industries, Inc., Pittsburgh, Pa.

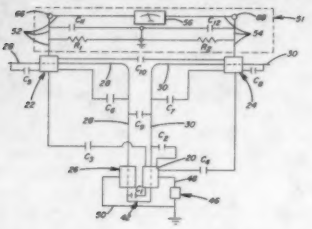
Filed Mar. 19, 1981, Ser. No. 245,473
Int. Cl.³ G01R *31/02, 27/26*
U.S. Cl. 324—51 **17 Claims**

1. A method of determining continuity of a conductor, comprising the steps of:

forming with the conductor a capacitor intermediate its ends to provide a transmitting capacitance coupling;

forming with the conductor a capacitor on each side of the transmitting capacitance coupling to provide a first receiving capacitance coupling and a second receiving capacitance coupling; and

determining the potential difference between the first and second receiving capacitance coupling to determine continuity of the conductor at least between the first and second receiving capacitance couplings.



4,409,542

MONITORING SYSTEM FOR AN LC FILTER CIRCUIT IN AN AC POWER NETWORK

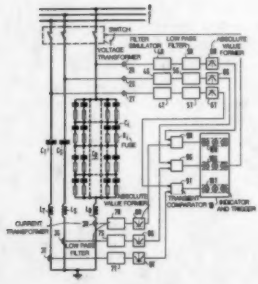
Michael Becker, Uttenreuth; Alfons Fendt, Erlangen; Dusan Povh, Nuremberg; Klaus Renz, Fürth; Gerhard Schuch, Erlangen, and Hermann Waldmann, Weiher, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 26, 1981, Ser. No. 266,279

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020107

Int. Cl.³ G01R *27/00*

U.S. Cl. 324—57 Q **5 Claims**



1. A monitoring system for an LC filter circuit connected to an AC power network, the LC filter circuit having a capacitor battery of the type having a plurality of parallel legs, each leg having a plurality of sectional capacitors connected in series with respective fuses, adjacent ones of the sectional capacitors being coupled to one another, the system further comprising:

electronic simulator means for determining the fundamental frequency component of a simulated filter current; and

transient comparator means for comparing said fundamental frequency component of said simulated filter current with a fundamental frequency component of a measured filter current.

4,409,543

IMPEDANCE METER

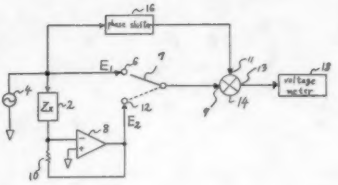
Noriyuki Sugihara, Hachioojishi, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 5, 1981, Ser. No. 240,719

Claims priority, application Japan, Mar. 11, 1980, 55-30740

Int. Cl.³ G01R *27/00, 25/00;* **H03D** *13/00*

U.S. Cl. 324—57 R **4 Claims**



1. An apparatus for measuring an impedance or a dissipation factor of a device, the apparatus comprising:

a reference oscillator, having an output coupled to the device, for applying a first voltage signal across the device to yield a current;

a converter, coupled at an input to the device, for converting the current to a second voltage signal and for presenting said second voltage signal at an output;

a phase shifter, coupled at an input to the reference oscillator, for selectively shifting the phase of the first voltage signal by either 0 or 90 degrees in response to a control signal and for presenting the 0 degree shifted first voltage signal or the 90 degree shifted first voltage signal at an output;

switch means, having a first input coupled to the output of the reference oscillator and a second input coupled to the output of the converter, for selecting one of a first and a second position in response to a control signal, whereby the first voltage signal is presented at an output when the first position is selected and the second voltage signal is presented at the output when the second position is selected;

synchronous rectifying means, having a first input coupled to the phase shifter output and a second input coupled to the switch means output, for presenting at an output a rectified signal such that said rectified signal represents a phase difference between the shifted first voltage signal and the first voltage signal when the first position is selected and the rectified signal represents a phase difference between the shifted first voltage signal and the second voltage signal when the second position is selected;

control means, coupled to the phase shifter and to the switch means, for presenting control signals to the phase shifter and to the switch means;

detecting means, coupled to the output of the synchronous rectifying means, for detecting the rectified signal and for measuring a phase difference A when the first switch position and the 0 degree shifted first voltage signal are selected, a phase difference B when the first switch position and the 90 degree shifted first voltage signal are selected, a phase difference C when the second switch and the 0 degree shifted first voltage signal are selected, and a phase difference D when the second switch position and the 90 degree shifted first voltage signal are selected; and,

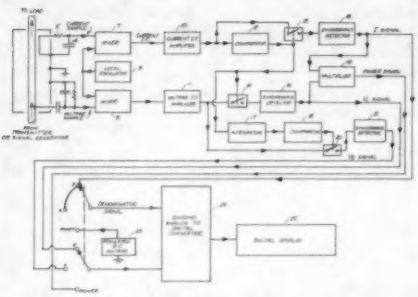
calculating means, coupled to the detecting means, for calculating B/A, D/C, and D/A and for determining the device impedance or the dissipation factor therefrom.

4,409,544

INSTRUMENTS FOR MEASUREMENT OF CARRIER POWER AND ANTENNA IMPEDANCE IN AM BROADCASTING

Robert W. Redlich, 9 Grand Park Blvd., Athens, Ohio 45701

Filed Jul. 6, 1981, Ser. No. 256,782
Int. Cl.³ G01R 27/04
U.S. Cl. 324—57 R 2 Claims



1. In an instrument for measuring the resistance and reactance of the antenna load on an AM broadcasting transmitter, the combination of;

heterodyning, long time-constant detection means for obtaining voltages I, V_i, and V_q that are proportional respectively to the magnitudes of carrier current, the component of carrier voltage that is in-phase with carrier current, and the component of carrier voltage that is in phase quadrature with carrier current, said carrier voltages and currents being those that exist in a transmission line between an AM broadcasting transmitter and its antenna load,

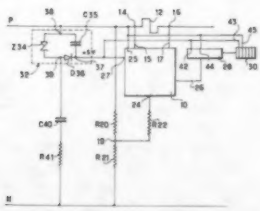
a dividing analog to digital converter having numerator and denominator inputs, with said voltage I impressed at all times on the denominator input, and said voltages V_i and V_q impressed selectively by means of a switch on the numerator input, so that the analog to digital converter is a digital signal proportional respectively to resistance and reactance of the antenna load.

4,409,545

ELECTRONIC MEASURING DEVICE FOR A POLYPHASE NETWORK, IN PARTICULAR FOR THE MEASUREMENT OF POWER

Alain Bazin, Villejuif, France, assignor to Enertec, Montrouge, France

Filed Feb. 11, 1981, Ser. No. 233,426
Claims priority, application France, Feb. 19, 1980, 80 03565
Int. Cl.³ G01R 19/00, 1/20
U.S. Cl. 324—107 13 Claims



1. In a device for measuring a quantity in a polyphase alternating current electrical distribution network which includes at least one first and one second phase conductor and one reference conductor, the device being of the type comprising a first and a second electronic measuring device for producing a signal representative of said quantity measured respectively on the first and the second phase conductor, and a summing device for providing the sum of the signal so produced, the device further including means for powering the electronic measuring devices and the summing device comprising:

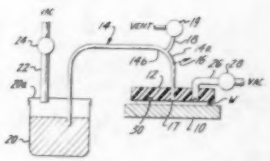
a first supply circuit connected to the first phase conductor for supplying a continuous supply voltage to the first measuring device, a supply device connected to the second phase conductor for supplying a continuous supply voltage to the second measuring device and a continuous supply voltage to the summing device, and a high-impedance tie circuit having a first end connected to the first supply circuit and a second end connected to the supply device, wherein the summing device is supplied with operating voltage so long as a potential difference exists between one of the phase conductors and the reference conductor.

4,409,546

MERCURY PROBE AND METHOD

Carl Shulman, Edgewater, N.J., assignor to MSI Electronics Inc., Woodside, N.Y.

Filed Jan. 19, 1981, Ser. No. 226,357
Int. Cl.³ G01R 1/06, 31/22; H01R 3/04
U.S. Cl. 324—158 P 17 Claims



1. The method of operating mercury probe apparatus of the type having at least one contact aperture in an aperture plate for engagement with a test wafer, a mercury reservoir and passage means between said aperture and the reservoir, the passage means having an opening into the reservoir below the level of the mercury therein, the contact aperture being above the level of the mercury in the reservoir so that the mercury is normally retracted from the contact aperture by gravity, said method including the steps of applying a pressure difference between the contact aperture and the upper surface of the mercury in the reservoir for thereby shifting mercury from the reservoir to the aperture to form at least one mercury-probe contact, electrically testing the wafer, and terminating said pressure difference for thereby allowing mercury in the passage means to descend from the contact aperture, said method including the further step of adjusting the level of the mercury in the reservoir so that said opening of the passage means into the reservoir is not deeper than about the level at which the buoyant force of the mercury at said opening tending to cause mercury to enter the passage means is balanced by the surface tension of the mercury across the opening whereby, when the pressure difference is terminated, mercury is expelled from the passage means into the reservoir for retention therein with any dross that may have entered said aperture.

4,409,547

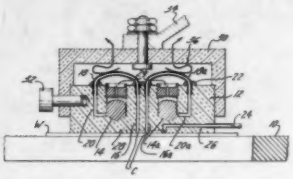
MERCURY-PROBE APPARATUS

Albert Lederman, New York, N.Y., assignor to MSI Electronics Inc., Woodside, N.Y.

Filed Mar. 17, 1981, Ser. No. 244,745
Int. Cl.³ G01R 1/06, 31/22; H01R 3/04
U.S. Cl. 324—158 P 13 Claims

1. Apparatus for testing semiconductor wafers, including a support for a test wafer and a mercury probe movable into test position overlying the test wafer, said mercury probe compris-

ing a reservoir of mercury and means defining a mercury passage having one end that opens into a submerged portion of said reservoir, the opposite end of the passage being formed in insulation and constituting a contact aperture, means for establishing a pressure difference between the reservoir and the contact aperture to fill the passage with mercury, said contact aperture being below the upper surface of the mercury in the



reservoir by a vertial distance, said vertical distance and the cross-section of the passage being so limited that, when said pressure difference is eliminated, surface tension of the mercury causes the mercury in the passage to be emptied automatically into the reservoir, said passage including means for inhibiting escape of mercury from the reservoir via said passage in case the probe is jolted while the contact aperture is unobstructed.

4,409,548

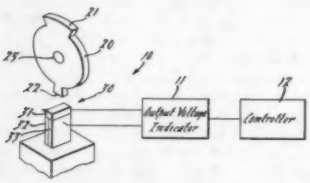
PIEZOELECTRIC APPARATUS FOR GENERATING ELECTRICALLY DISTINGUISHABLE BIPOLAR SIGNALS

Louis R. Focht, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 6, 1981, Ser. No. 280,744

Int. Cl.³ G01P *3/48, 3/54*

U.S. Cl. 324—168 **11 Claims**



1. A pulse generating means for providing electrically distinguishable signals, said signals occurring as a function of position of a relatively moveable element, said pulse generating means comprising:

a wheel means coupled to said relatively movable element for generating changes in magnetic flux;

a pickup receiving means located in energy transfer coupling with respect to said wheel means for providing electrically distinguishable signals in response to passage of said wheel means past said pickup means;

said wheel means including a tooth means extending along a portion of the circumference of said wheel means and projecting toward said pickup means for generating changes in magnetic flux at said pickup as said wheel rotates;

said pickup receiving means including a permanent magnet, coupled to a piezoelectric ceramic transducer capable of electrically generating a piezoelectric signal of two polarities, said magnet being sufficiently close to a path of rotation for said teeth means so that movement of said teeth means past said pickup receiving means causes a change of magnetic flux and applies a force to said magnet which applies a stress to the ceramic transducer thereby creating a piezoelectric voltage;

said wheel means including at least one tooth positioned around the circumference of said wheel and having a leading edge and a trailing edge as said wheel rotates so that said leading edge produces a signal of a first polarity and said trailing edge produces a signal of a second polarity, opposite from said first polarity, with an intermediate zero crossing between said signal of said first polarity and said signal of said second polarity; and

said pickup receiving means including a rigid base for mounting said piezoelectric ceramic transducer thereby providing a cantilevered support for said magnet so that said piezoelectric ceramic transducer can bend in two differen. directions from an undeflected reference position and produce said first polarity signal by bending in a first direction and said second polarity signal by bending in a second direction.

4,409,549

CARRIAGE MOUNTED APPARATUS FOR DETECTING SURFACE DEFECTS IN FLAT SURFACED METALLIC OBJECTS

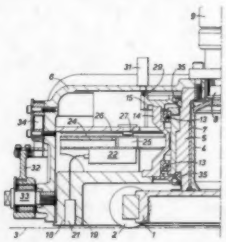
Henry C. Garner, Swinton; Jack Broadbent, Rotherham; David H. Savidge, Rotherham, and Eric Wadsworth, Dinnington, all of England, assignors to British Steel Corporation, London, England

Filed Jan. 21, 1981, Ser. No. 226,638

Claims priority, application United Kingdom, Jan. 29, 1980, 8002887

Int. Cl.³ G01N *27/90*; G01R *33/12*

U.S. Cl. 324—262 **2 Claims**



1. Apparatus for inspecting a flat surface of an elongate metallic object which comprises:

(a) a carriage operable to traverse the object surface to be inspected;

(b) a rotor rotatably mounted on the carriage and coupled to a flexible drive such that it rotates about an axis perpendicular to the object surface;

(c) a scanning disc attached to the rotor so as to rotate about the periphery of the carriage about an axis perpendicular to the object surface;

(d) high frequency energized eddy-current probes located within recesses in the periphery of the scanning disc so that the probes scan the object surface at locations outboard of the carriage;

(e) a housing for the scanning disc supported on the carriage; and,

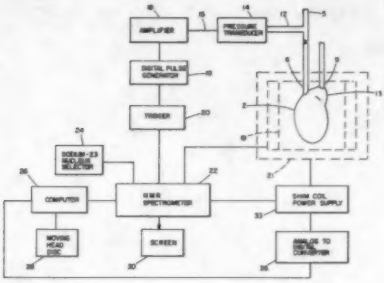
(f) a gimbal device positioned about the circumference of the housing and operable in concert with the housing to position the scanning disc vertically above and substantially parallel to the object surface to be inspected.

4,409,550

NMR SODIUM IMAGES

Eric T. Fossel, West Newton, and Jean L. Delayre, Quincy, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed May 15, 1981, Ser. No. 264,100
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—300 **6 Claims**



1. Apparatus for producing a sodium NMR image of sodium-containing biological tissue having a physical characteristic capable of fluctuation, said apparatus comprising

an NMR pulse spectrometer capable of providing a plurality of observation pulses and changing magnetic field gradients for producing an image,

sodium-23 nucleus selector means connected to said spectrometer,

sensing means for sensing said physical characteristic and providing an output signal, and

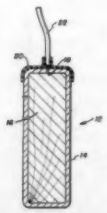
triggering means responsive to said sensing means output signal and connected to said spectrometer for triggering said spectrometer to produce said observation pulses at a selected point in the course of said fluctuation of said physical characteristic of said tissue.

4,409,551

TELLURIC SURVEY ELECTRODE

Lonnie J. Norton, Cedar Hill, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,897
Int. Cl.³ G01V *3/00*
U.S. Cl. 324—349 **5 Claims**



1. A telluric survey electrode for temporary ground insertion comprising:

elongated-housing constructed of an electrically conductive metal;

insulating means within said housing for fortifying said housing;

connector means soldered to one end of said elongated housing for removal of said survey electrode from the ground and for providing an electrical path to and from said electrode; and

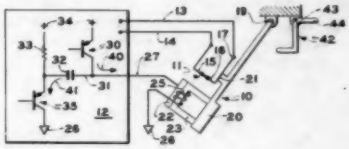
sealing means at each end of said housing having at least one end soldered for providing a generally smooth airtight barrier between said connector means and outside ambiance.

4,409,552

CYCLIC MEANS WITH MAGNETIC LATCH FOR CHECKING SWITCH INTEGRITY

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 16, 1981, Ser. No. 254,813
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—415 **9 Claims**



1. A means for checking the electrical integrity of electric switch means, including: switch means capable of being mechanically operated by movement of a biased mechanical mass; magnetic means including electromagnetic means and permanent magnetic means with said magnetic means having two relatively moveable parts with said relatively moveable parts being attracted to each other against said biased mechanical mass by said permanent magnetic means when said electromagnetic means is deenergized; a first of said parts being moved with said biased mechanical mass and a second of said parts being fixed in space; said permanent magnetic means holding said two moveable parts engaged to establish a first state for said switch means, and said electromagnetic means being energized to neutralize said permanent magnetic means to allow said biased mechanical means to disengage said two moveable parts to establish a second state for said switch means; reset means capable of manually moving said baised mechanical mass from said second state to said first state in the event that said two moveable parts fail to become engaged; electric circuit means connected to said electromagnetic means and said switch means to controllably energize said electromagnetic means to allow said moveable parts to move from said first state to said second state; said biased mechanical mass tending to return said moveable parts toward said first state with said electric circuit means being operated to reverse the energization of said electromagnetic means at a proper time to cause said electromagnetic means to attract and hold said moveable parts in said first state; and said electric circuit means verifying the operation of said switch means when said moveable parts change between said states.

4,409,553

PARAFFIN MONITOR

Carlton M. Slough, Spring, and Edwin L. Colling, Jr., Sugarland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

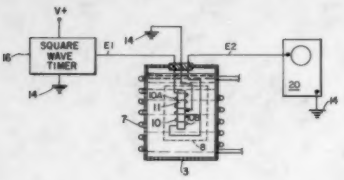
Continuation of Ser. No. 194,696, Oct. 6, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,359
Int. Cl.³ G01N *27/00, 33/28*
U.S. Cl. 324—445 **6 Claims**

1. A paraffin monitor which comprises:

pulse means connected to ground, the pulse means being means for periodically providing electrical pulses to a signal means;

signal means connected to the pulse means and to ground and immersed in a medium having paraffin, the signal

means being means for providing an oscillating decaying signal in response to each pulse from the pulse means, with the frequency and decay time of the oscillating decaying signal decreasing in accordance with the build-up of paraffin on the signal means; and



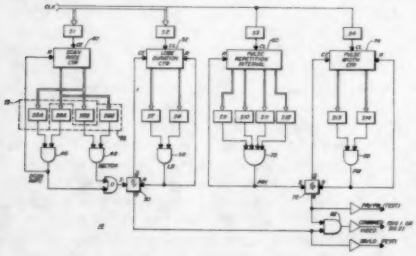
indicating means connected to the signal means and to ground, the indicating means being means for providing an indication of the paraffin build-up in accordance with the signal from the signal means.

4,409,554

ELECTRONIC SIGNAL SIMULATION DEVICE

Joe B. Lentz, 317 Silver Fox La., Goose Creek, S.C. 29445

Filed Feb. 25, 1981, Ser. No. 237,834
Int. Cl.³ H03K *3/017, 7/06*
U.S. Cl. 328—14 **13 Claims**



1. An electronic signal simulator device comprising:

a master clock having a stable oscillator and outputting a plurality of discrete frequencies derived from said stable oscillator;

a modulation generator having at least one signal output channel, said modulation generator having as an input said discrete frequencies which are used to generate an output signal with a predetermined signal characteristic;

said signal output channel having a plurality of clock switches, each of said clock switches selecting one of said discrete frequencies, a plurality of counters, each of said counters being connected to one of said clock switches to count the frequency pulses of said discrete frequency selected, and a plurality of parameter switches connected to the outputs of said counters to select said predetermined signal characteristic for said output signal; and

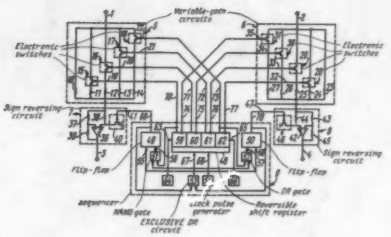
means for supplying electrical power to said master clock and said modulation generator.

4,409,555

QUADRATURE STEPWAVE FREQUENCY CONVERTER

Mart V. Min, ulitsa Ladva, 26; Toomas E. Parve, bulvar Ryannaku, 3, kv. 7; Khyarmo E. Khyarm, ulitsa Silla, 2, kv. 2, and Toom A. Pungas, Sypruse pst, 219, kv. 3, all of Tallin, U.S.S.R.

PCT No. PCT/SU80/00121, § 371 Date Aug. 4, 1981, § 102(e) Date Aug. 4, 1981, PCT Pub. No. WO81/01762, PCT Pub. Date Jun. 25, 1981
PCT Filed Jul. 31, 1981, Ser. No. 293,632
Claims priority, application U.S.S.R., Dec. 11, 1979, 2845551
Int. Cl.³ H03B *19/00;* **H03K** *5/00*
U.S. Cl. 328—14 **5 Claims**



1. A quadrature stepwave frequence converter comprising a two-output device having a plurality of control inputs for changing the gains for the signals transmitted from its inputs to its outputs upon a change in the values of the binary signals at the control inputs, and a sequencer having its outputs connected to the control inputs of the two-output device for applying binary signals to said control inputs so as to vary the gain for the signal transmitted from the input of the two-output device to its one output according to a step variable function approximating a sine wave and to vary the gain for the signal transmitted from the input of the device to its other output according to a step variable function approximating a cosine wave, wherein the improvement comprises said two-output device comprising first and second variable-gain circuits, each having N control inputs forming a separate group of the control inputs of the device and respectively corresponding to the control inputs of the other variable-gain circuit for changing the absolute value of the gain for the signal transmitted from a first input of the device to a first output upon a change in the value of the binary signal applied to a control input of said first variable-gain circuit and the absolute value of the gain for the signal transmitted from a second input of the device to a second output upon a change in the value of the binary signal applied to a control input of the second variable-gain circuit so that a change in the value of the binary signal applied to a control input of a variable-gain circuit produces a change in the absolute value of the corresponding gain by a predetermined value corresponding to this control input and in a direction determined by the direction of the change in the binary signal and so that changes in the binary signals applied to the control inputs of one variable-gain circuit produce changes in the corresponding gain which are proportional to the changes in the other gain produced by changes in the binary signals at the corresponding control inputs of the other circuit; and first and second sign reversing circuits, said first sign reversing circuit being connected to said first variable-gain circuit and the second sign reversing circuit being connected to the second variable-gain circuit, each of the sign reversing circuits having a control input forming another control input of the two-output device for reversing upon a change in the value of the binary signal at the control input of the sign reversing circuit the sign of the gain, the absolute value of which is varied by means of the variable-gain circuit connected to this sign reversing circuit; wherein the sequencer has first and second sign control outputs, said first sign control output being connected

to the control input of said first sign reversing circuit and the second sign control output being connected to the control input of the second sign reversing circuit for applying to said control inputs binary signals each changing its value at regular intervals and which are shifted in phase with respect to each other by 90°, and a plurality of gain value control outputs connected to the control inputs of the variable-gain circuits for changing the value of the binary signal applied to each of the control inputs of said first variable-gain circuit first in a direction providing an increase in the gain absolute value and then in a direction providing a decrease in the gain absolute value during each time period between two successive changes in the binary signal at the control input of the first sign reversing circuit connected to the first variable-gain circuit so that a change in the binary signal at each next-in-order control input of said first variable-gain circuit in a direction providing an increase in the gain absolute value occurs after a change in a similar direction in the binary signal at the preceding-in-order control input of said first variable-gain circuit (5), a change in the binary signal in a direction providing a decrease in the gain absolute value occurs before a change in a similar direction in the binary signal at the preceding-in-order control input of said first variable gain circuit, and for changing the binary signals applied to the control inputs of the second variable gain circuit so that the instant of change in the value of the binary signal at that control input of the second variable-gain circuit which corresponds to the "k"th-in-order control input of the first variable gain circuit in a direction providing a change in the gain absolute value in one sense coincides with the instant of change in the value of the binary signal at the (N − k + I)th-in-order control input of the first variable gain circuit in a direction providing a change in the gain absolute value in the opposite sense.

4,409,556

AMPLIFIER ARRANGEMENT WITH VERY LOW DISTORTION

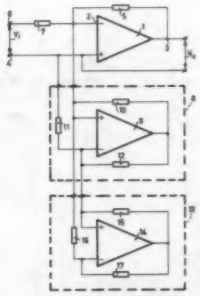
Theodorus J. Van Kessel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,771

Claims priority, application Netherlands, Jul. 7, 1980, 8003905

Int. Cl.³ H03F *1/34, 1/26, 3/45*

U.S. Cl. 330—75 **9 Claims**



1. An amplifier arrangement comprisng: an amplifier having an inverting input, a non-inverting input and an output, a first impedance coupled between the output and the inverting input of the amplifier and a second impedance coupled between an input terminal of the amplifier arrangement and the inverting input of the amplifier, an impedance network having a first and a second terminal, means coupling said network between the inverting input and the non-inverting input of the amplifier, the value of the impedance of said impedance network substantially corresponding to the impedance value of a parallel connection of the first impedance and the second impedance, but of opposite sign.

4,409,557

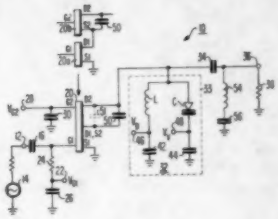
BANDPASS FILTER WITH AN ACTIVE ELEMENT

Franco N. Sechi, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1981, Ser. No. 256,724

Int. Cl.³ H03F *3/191*

U.S. Cl. 330—277 **19 Claims**



1. A bandpass filter for passing radio frequency signals, including frequency F, over a given range of frequencies comprising in combination:

a circuit reference point;

an output terminal;

a negative resistance means including first and second amplifying means connected in cascode between said reference point and said output terminal with said first amplifying means coupled between said second amplifying means and said reference point and responsive at an input terminal thereof to said radio frequency signals which include said frequency F for amplifying the same, means for feeding back in phase a sufficient portion of the signal appearing at said output terminal to the junction of said first and second amplifying means for producing a negative resistance at said output terminal relative to said circuit reference point; and

an inductor and a capacitor coupled to said output terminal to form a resonant circuit having a center frequency of said F and having undesired resistance which is offset by said negative resistance.

4,409,558

GAIN COMPENSATED TRANSISTOR AMPLIFIER

Johannus P. H. Knijnenburg, and Bernardus Verhoeven, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,568

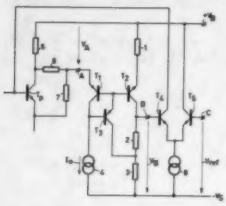
Claims priority, application Netherlands, Feb. 25, 1980, 8001116

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—288 **6 Claims**

1. Am amplifier arrangement comprising an input terminal and an output terminal, a first and a second transistor of the same conductivity type whose base electrodes are interconnected, means connecting the emitter electrode of the first transistor to the input terminal, means connecting the emitter of the second transistor to a first common circuit point via a first resistor, means connecting the collector of the first transistor to a quiescent-current source, means connecting the collector of the second transistor to the output terminal and, via a second resistor, to a power-supply terminal, a base drive circuit having an input connected to the collector electrode of the first transistor, a voltage follower output connected to the base electrodes of the first and second transistors for driving said base electrodes so that the current in the first transistor is equal to the quiescent current from said quiescent-current source,

and a base-current diverting output to which at least a part of the base currents of the first and second transistors flow, and means connecting said base-current diverting output to a tapping on the second resistor located so that the voltage across



the second resistor depends on the current gain factors of the first and second transistors to a minimal extent when the voltage at the input terminal has a value that corresponds to the voltage across the first resistor.

4,409,559

SUPPLY VOLTAGE CONTROLLED STEREOPHONIC AMPLIFIER SYSTEM

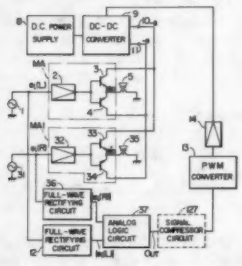
Nobutaka Amada; Harushige Nakagaki, and Shigeki Inoue, all of Toyokawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 247,736

Claims priority, application Japan, Mar. 26, 1980, 55-37538; Dec. 4, 1980, 55-170268

Int. Cl.³ H03F *3/68*

U.S. Cl. 330—295 **8 Claims**



1. A power supply controlled stereophonic amplifier system comprising:

two main amplifier circuits respectively corresponding to left and right channels;

a switching regulator having a switching element for supplying a voltage to the main amplifier circuits;

input signal level detecting means for detecting input signals supplied to said main amplifier circuits to produce a detected signal having a magnitude equal to the larger of the absolute values of the input signals;

means for controlling said switching element in response to a compressed output signal produced from the detected signal, the supplied voltage of said main amplifier circuits varying as a function of said input signals;

said input signal level detecting means including a signal compressor means which is responsive to the detected signal for producing the compressed output signal which is supplied to said means for controlling said switching element whereby the voltage supplied to said main amplifier circuits is controlled.

4,409,560

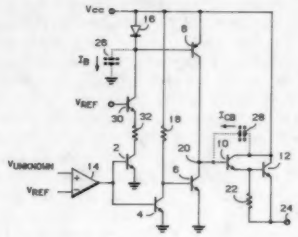
OUTPUT TRANSIENT SUPPRESSION CIRCUIT

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,612

Int. Cl.³ H03F *3/04;* **H03K** *5/22*

U.S. Cl. 330—296 **8 Claims**



1. An output circuit powered by a source of supply voltage and having an output node, comprising:

first means for receiving an input signal capable of assuming first and second states;

second means coupled to said first means and to said output node for generating a first voltage at said output node when said input signal is in said first state and for generating a second voltage at said output node when said input signal is in said second state, said second means including a current source coupled to said first means and to said output node for supplying current to said output node when said input signal is in said second state, said current source being turned off when said input signal is in said first state; and

third means coupled to said second means and said output node for clamping said output node to said first voltage when said source of supply voltage is turned on, said third means comprising: current sinking means coupled to said output node for diverting current from said output node; and switching means coupled to said current sinking means and to said source of supply voltage for turning said current sinking means off when said input signal is in said second state.

4,409,561

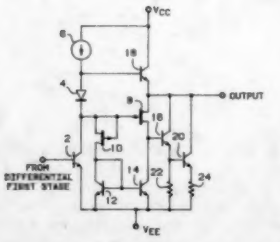
OPERATIONAL AMPLIFIER OUTPUT STAGE DRIVEN BY A SINGLE ENDED GAIN STAGE

Stuart B. Shacter, Mesa, Ariz., assignor to Motorali, Inc., Schaumburg, Ill.

Filed Apr. 13, 1981, Ser. No. 253,980

Int. Cl.³ H03F *3/16, 3/26*

U.S. Cl. 330—300 **5 Claims**



1. In an operational amplifier of the type which includes a differential first state, an output circuit having an intput and an output, comprising:

a voltage gain transistor having a base electrode coupled to the output of said differential first stage, an emitter adapted to be coupled to a first source of supply voltage, and having a collector;

a current source coupled to the collector of said voltage gain transistor and adapted to be coupled to a second source of supply voltage;

first means coupled to said collector of said voltage gain transistor and to said output and responsive to current flowing from said current source for establishing a quiescent voltage at said output, said first means including:

diode means coupled between said current source and the collector of said voltage gain transistor;

a first junction field effect transistor having gate and source electrodes coupled to the collector of said voltage gain transistor and having a drain electrode;

a second junction field effect transistor having a gate electrode coupled to the collector of said voltage gain transistor, a source electrode coupled to said output and a drain electrode; and

current mirror means coupled between the drain electrode of said first junction field effect transistor and a drain electrode of said second junction field effect transistor;

voltage pull-up means coupled between said current source and said output for producing a first output voltage at said output when a first input voltage appears on said base electrode of said voltage gain transistor; and

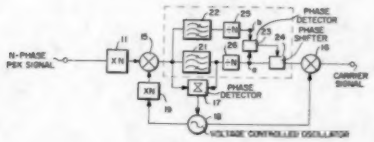
voltage pull-down means coupled to said output and to said first means for producing a second output voltage at said output when a second input voltage is applied to the base electrode of said voltage gain transistor.

4,409,562

PHASE CORRECTION CIRCUIT EMPLOYING BANDPASS FILTERS

Hiroshi Kurihara, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 202,444, Aug. 6, 1980, abandoned. This application Jun. 3, 1981, Ser. No. 269,860
Claims priority, application Japan, Aug. 12, 1978, 53-152342
Int. Cl.³ H03D *3/18*; H03L *7/00*
U.S. Cl. 331—1 A **12 Claims**



1. A phase correction circuit, comprising:

first means, having an input point and having first and second output points with different equivalent noise bandwidths, for receiving a signal to be filtered at said input point and for generating therefrom bandpass-filtered signals at said first and second output points;

phase detector means for detecting the phase difference between signals at said first and second output points; and

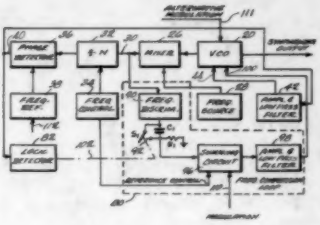
phase shifter means connected to the output of said phase detector means and the output point having the larger equivalent noise bandwidth for changing the phase of the signal at the output point having the larger equivalent noise bandwidth when a phase difference is detected.

4,409,563

PHASE LOCKED LOOP FREQUENCY SYNTHESIZER WITH FREQUENCY COMPRESSION LOOP

Johannes J. Vandegraaf, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Feb. 26, 1981, Ser. No. 238,655
Int. Cl.³ H03C *3/00*; H03L *7/22*
U.S. Cl. 331—11 **17 Claims**



13. A phase locked loop synthesizer, comprising:

phase locked loop (PLL) means, having a first characteristic loop bandwidth, for generating a synthesized signal, said PLL means including a signal controlled oscillator (SCO) having first and second control inputs for controlling the frequency of said SCO, said first control input receiving a signal from said PLL; and

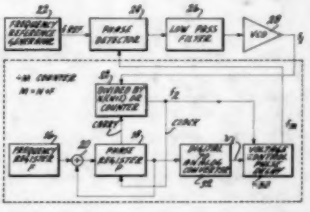
subsidiary frequency compression loop (FCL) means having a second characteristic bandwidth wider than said first characteristic bandwidth, said FCL means having an output coupled to said second control input of said SCO whereby said SCO is subject to frequency control by both said PLL means and said FCL means.

4,409,564

PULSE DELAY COMPENSATION FOR FREQUENCY SYNTHESIZER

Kwok S. Lo, San Diego, Calif., assignor to Wavetek, San Diego, Calif.

Filed Mar. 20, 1981, Ser. No. 245,996
Int. Cl.³ H03L *7/18*
U.S. Cl. 331—16 **16 Claims**



11. A pulse delay compensator for use with a divide counter dividing a frequency signal by a first positive integer or a second positive integer to produce a divided frequency signal having a division ratio equivalent to a number including an integer and a fixed fractional number and with the first and second positive integers a number of integers apart, including,

means for controlling the divide counter to divide the frequency signal by the first or second positive integer,

the controlling means including means for repetitively summing the fixed fractional number to produce a summation with each divide by the dividing means and with the control of the divide counter in accordance with each

overflow in excess of a predetermined summation value produced by the repetitive summing, and

means coupled to the divide counter and to the repetitive summing means for producing pulse delay compensation for the divided frequency signal in accordance with the repetitive summing to equalize the pulse period between adjacent pulses in the divided frequency signal.

4,409,565

CIRCUIT ARRANGEMENT FOR PRODUCING A LOW FREQUENCY ALTERNATING CURRENT

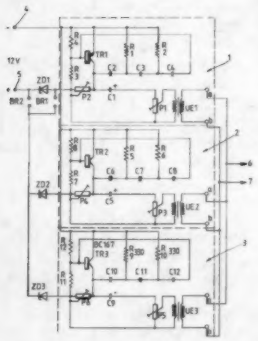
Erich Scherer, Wiesenstrasse 18, D-6603 Sulzbach, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,931

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007717

Int. Cl.³ H03B *21/01;* **A61N** *1/36*

U.S. Cl. 331—40 **11 Claims**



1. An apparatus including a circuit arrangement for producing a low frequency alternating output current having a frequency within the range of 0 to 100 Hz comprising at least three sine wave oscillation generators (**1**, **2**, **3**) each producing a basic oscillation having a fundamental frequency of about 4000 Hz, direct current power supply means operatively connected to said sine wave oscillation generators for supplying d.c. power to said generators, common generator output terminals (**6**, **7**) operatively connected in parallel to all three generators for providing said output current in the form of low frequency beats, each generator comprising a plurality of oscillation circuits (R_1, C_2; R_2k C_3) for producing different harmonic modulating frequency signals for modulating said basic oscillation, a regenerative feedback circuit (C_4, C_8, C_{12}) operatively connecting its respective oscillation circuits to the input of its oscillation generator for said modulating of the basic oscillation, each generator further comprising an input circuit including an input potentiometer (P_2, P_4, P_6) operatively connected to the input of the respective generator for varying said modulating frequency signals by varying the operating point of its respective generator, output means (**49**, **50**), and low frequency amplifier means (**44**) operatively connected between said common generator output terminals and said output means, whereby said output means are supplied with said low frequency output current having the frequency of said beats.

4,409,566

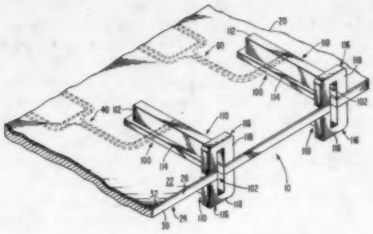
COAXIAL LINE TO WAVEGUIDE COUPLER

Willard T. Patton, Moorestown, and Robert J. Mason, Medford, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,453

Int. Cl.³ H01P *5/103*

U.S. Cl. 333—26 **8 Claims**



1. A coaxial transmission line to waveguide coupling structure for operation over a frequency range, said structure comprising:

a base plate having first and second major surfaces and an edge surface, said base plate having an elongated transmission line cavity therein;

an inner conductor disposed in said transmission line cavity and spaced from said base plate to form a coaxial transmission line with said base plate forming the outer conductor of said coaxial line, said coaxial transmission line terminated at one end;

said base plate having a tapered slot extending completely therethrough, said slot intersecting and extending beyond said coaxial transmission line; and

first and second waveguide half-pieces, said first and second waveguide half-pieces contacting and extending from said first and second major surfaces, respectively, of said base plate over the region of said slot to form a waveguide having ridge loading provided by said base plate, said waveguide terminated at one end, said wavelength half-pieces extending the length of said slot whereby said waveguide and said coaxial line intersect and cross.

4,409,567

SURFACE ACOUSTIC WAVE DEVICE

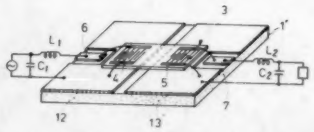
Kentaro Setsune, Sakai, and Toshihide Tanaka, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 24, 1980, Ser. No. 220,254

Claims priority, application Japan, Dec. 28, 1979, 54-171166

Int. Cl.³ H03H *9/145, 9/42, 9/64*

U.S. Cl. 333—151 **4 Claims**



1. A surface acoustic wave device comprising:

(a) an SAW (surface acoustic wave) element having an SAW propagating substrate,

an input piezoelectric transducer having a pair of comb-shaped electrodes which are coupled with each other and formed on said SAW propagating substrate and for generating an SAW on said SAW propagating substrate responding to an input electric signal,

an output piezoelectric transducer having another pair of

another comb-shaped electrodes which are coupled with each other and formed on said SAW propagating substrate and for generating an output electric signal responding to said SAW on said SAW propagating substrate,

(b) a printed circuit having an insulation substrate,

wiring conductors formed on a surface of said insulation substrate as a signal input electrode and as a signal output electrode, and at least one of said wiring conductors including one among an inductor and a capacitor,

an input side grounding conductor formed on said surface and an output side grounding conductor formed on said surface, said input side grounding conductor and said output side grounding conductor being isolated from each other by an isolation gap inbetween,

(c) fixing means for fixing said SAW element on said printed circuit,

(d) connecting means for connecting said comb-shaped electrodes of said input piezoelectric transducer to said signal input electrode and to said input side grounding conductor, and

(e) another connecting means for connecting said another comb-shaped electrodes of said output piezoelectric transducer to said signal output electrode and to said output side grounding conductor.

4,409,568

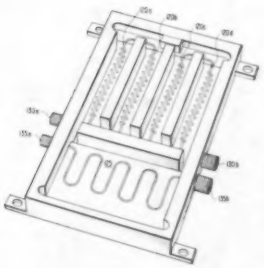
TEMPERATURE COMPENSATED TIME DELAY ELEMENT FOR A DIFFERENTIALLY COHERENT DIGITAL RECEIVER

William H. Childs, Gaithersburg, and Peter A. Carlton, Clarksburg, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Jan. 9, 1981, Ser. No. 223,645

Int. Cl.³ H01P *9/00;* **H03D** *3/02*

U.S. Cl. 333—156 **15 Claims**



1. A signal delay circuit having first and second parallel paths providing signal delays t_D and t_U respectively, said circuit having a preselected net delay t_R, means in said second path for producing variations in delay with temperature to offset the changes in delay with temperature of the first path, the first path having a temperature coefficient α_D and the second path having temperature coefficient α_U of the same sign as α_D, wherein $t_R = t_D - t_U$.

4,409,569

FILTER CIRCUITS HAVING TRANSFORMERS AS FILTER ELEMENTS

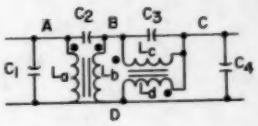
Jerome Potash, Flemington, N.J., assignor to OPT Industries, Inc., Phillipsburg, N.J.

Filed Nov. 2, 1981, Ser. No. 317,438

Int. Cl.³ H03H *7/09, 7/075*

U.S. Cl. 333—177 **7 Claims**

1. An improved filter circuit comprising at least two transformers and having a frequency characteristic corresponding to that of a given filter circuit including at least four individual inductors, comprising a pair of transformers each having a T or pi network equivalent circuit consisting of three inductance values, wherein two inductance values correspond to those of two of said individual inductors, the third inductance value of one of said equivalent circuits being positive and the third inductance value of the other end of said equivalent circuits being negative and equal to the third inductance value of the first-mentioned of said equivalent circuits, said transformers being interconnected so that said equivalent circuit third in-



ductance values are in series or in parallel with each other, whereby the third inductance values do not affect the frequency characterisitc of said filter circuit, each transformer having a primary winding and a secondary winding, one end of the primary winding of each transformer being connected to one end of the secondary winding thereof so that said windings are effectively connected in series with each other, the windings of one transformer being connected in series aiding relationship and the windings of the other transformer being connected in series opposing relationship.

4,409,570

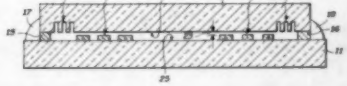
SEPARATED SUBSTRATE ACOUSTIC WAVE DEVICE

William J. Tanski, Maynard, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 322,044

Int. Cl.³ H03H *9/64, 9/42, 9/25, 9/54*

U.S. Cl. 333—187 **12 Claims**



1. A shallow bulk acoustic wave delay filter, including:

a base substrate having a first surface;

active piezoelectric substrate means for propagating acoustic waves therein, said active means having a first surface disposed adjacent to and opposite from said base substrate first surface;

transducer means affixed to said base substrate first surface in energy coupling non-contacting relation to said active substrate for coupling energy between said transducer means and said active substrate; and

means for separation disposed between said active substrate and said base substrate for fixing a separation distance between said active substrate first surface and said base substrate first surface.

4,409,571

SURFACE ACOUSTIC WAVE FILTERS

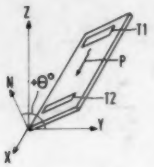
Robert F. Milsom, Redhill; Robert J. Murray, Horley, and Ian Flinn, Crawley, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 303,806

Claims priority, application United Kingdom, Oct. 8, 1980, 8032360

Int. Cl.³ H03H *9/64, 9/145*

U.S. Cl. 333—196 **6 Claims**



1. A surface acoustic wave bandpass transversal filter comprising a $+\theta°$ rotated Y-cut lithium niobate substrate, an input and an output transducer each including an interdigital array of strip-like electrodes arranged on the substrate to respectively launch and receive surface acoustic waves propagating in the X direction, characterized in that the spacing, overlap and the number of strip electrodes in said input and output transducer interdigital electrode arrays are chosen and provided so as to cause the transfer response from the input transducer to the output of the output transducer of the filter to have a passband with a 35 db fractional bandwidth Δ in the range 0.05 to 0.5, and to have an upper stopband of at least 35 db from said passband up to a frequency approximately equal to

$$\left(\frac{V_L}{V_S} - \frac{\Delta}{2}\right)$$

F_C where V_L and V_S are the velocities in the X direction of the substrate of longitudinal bulk acoustic waves and surface acoustic waves, respectively, and F_C is the centre frequency relative to the 35 db fractional bandwidth Δ, and in that $\theta°$ is in the range from 121° to 127°.

4,409,572

ELECTRIC SWITCH

Angelo Mostosi, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

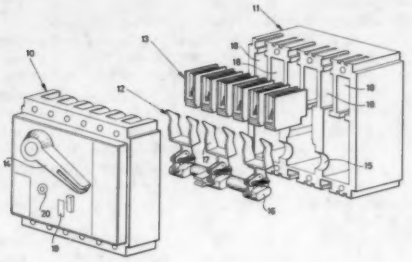
Filed Mar. 24, 1982, Ser. No. 361,580

Claims priority, application Italy, Apr. 2, 1981, 21367/81[U]

Int. Cl.³ H01H *75/00, 77/00, 83/00*

U.S. Cl. 335—8 **2 Claims**

1. An electric switch comprising two main constructional units defining a switch housing, a first of said units housing fixed contacts, associated terminals and tripping means; a second of said units carrying substantially the entire mechanical control mechanism of said electric switch including a manually operative handle movable between off and on positions, means carried by said second unit for displaying the electrical status of said electric switch, means for pivotal supporting movable contacts between opposing surface portions of each of said units whereby said movable contacts can be moved by the operation of said handle into and out of contact with said fixed contacts, said pivotal supporting means including an arbor carrying movable contacts, said arbor being confined by and seated relative to said opposing surface portions of said units, and means for removably fastening said units together to retain



said arbor confined by and seated relative to said opposing surface portions.

4,409,573

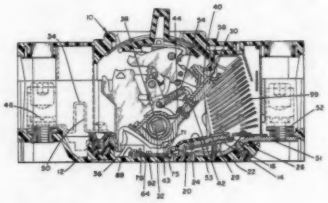
ELECTROMAGNETICALLY ACTUATED ANTI-REBOUND LATCH

Bernard Di Marco, Bellefontaine, and Andrew J. Kralik, Marysville, both of Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 23, 1981, Ser. No. 257,305

Int. Cl.³ H01H *77/10*

U.S. Cl. 335—16 **25 Claims**



1. A circuit breaker comprising:

a first electrically conductive arm equipped with a first electrical contact at one end thereof;

a second electrically conductive arm equipped with a second electrical contact at one end thereof, said second arm movable from a closed position wherein said contacts are engaged to allow current to flow between said contacts to said arms and to an open position wherein said contacts are disengaged to prevent current from flowing between said first and second arms, said first and second arms being operatively positioned so that electrodynamic forces generated by current flowing in said arms and acting therebetween will move said second arm from said closed to said open position when the current through said contacts exceeds a predetermined amount; and

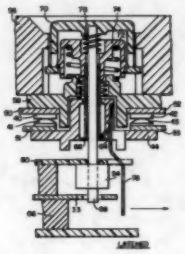
magnetically activated means for operatively engaging said second arm to maintain said second arm in said open position after said second arm has been moved by said electrodynamic forces said magnetically activated means being mounted for movement independent of movement by said second arm and being activated by the flow of current in said second arm.

4,409,574

GROUND FAULT CIRCUIT INTERRUPTER WITH A UNIFIED TEST AND RESET SWITCH MECHANISM

John J. Misencik, Shelton, and Alden K. Clements, Stratford, both of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1982, Ser. No. 342,025
Int. Cl.³ H01H 73/22
U.S. Cl. 335—18 7 Claims



1. A ground fault circuit interrupter comprising:

means for interrupting applied power to a load upon occurrence of a ground fault by opening a pair of power contacts;

a test circuit branch, including a pair of test contacts, connected to simulate a ground fault when said test contacts are closed;

a test and reset mechanism for testing said interrupter means to determine its operability and for resetting said interrupter means after it has performed a ground fault or test trip;

said mechanism comprising a single manually operable force applying element accessible on the exterior of the interrupter,

latch and spring means for holding said force applying element at a first, latched, position in normal operation in which said power contacts are closed and said test contacts are open,

means responsive to a first externally applied movement of said single manually operable force applying element for sequentially achieving second and third positions of which said second position is a test position in which said power contacts are closed and said test contacts are also closed, and said third position is a tripped position in which the release of said latch and spring means has occurred and said power contacts are open,

means responsive to a second externally applied movement of said single manually operable force applying element for achieving a fourth position which is a reset position in which said power contacts are open and said test contacts are closed, and after achieving said fourth position said mechanism returns to said first, latched, position.

4,409,575

ELECTROMAGNETIC CONTACTOR

Masanao Hisadome, Kuwana, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 24, 1981, Ser. No. 286,659
Claims priority, application Japan, Aug. 7, 1980, 55-111842[U]; Dec. 20, 1980, 55-183572[U]
Int. Cl.³ H01H 9/26
U.S. Cl. 335—160 2 Claims

1. A reversible electromagnetic contactor comprising:

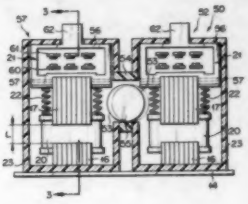
two electromagnetic contactor units each including a coil for exciting a fixed iron core, a movable iron core which is in a predetermined inoperative position when the fixed iron core is not excited but pulled toward the fixed iron core and contacted therewith when the fixed iron core is excited, and a spring means for urging the movable iron core to the inoperative position;

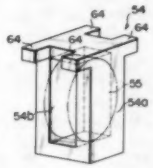
a roller;

a connecting member held between the two units and provided with a through-groove which holds the roller movable in any direction toward the both units; and

holding means for pushing the roller toward the inoperative unit and holding the movable iron core of said unit in the inoperative position when the movable iron core of the other unit moves to the operative position;

wherein the distance in which the roller can move along the through-groove of the connecting member is made shorter than the diameter of said roller, and the holding means in each of the units is a movable frame attached to the movable iron core in each of the units and, when one





of the units is excited, forces the roller into the other of units causing the roller to contact the movable frame of the other unit and to prevent the movement of this movable frame toward the operative position; and

wherein the connecting member has two parallel side walls which define the through-groove, and roller supporting holes formed in the side walls to be aligned with each other, and the roller has a shaft whose diameter is smaller than that of the roller supporting hole, and said connecting member and roller are made of somewhat resilient material permitting the roller to be forced into the through-groove of the connecting member in such a way that the roller can be positioned in the through-groove with its shaft projected into the roller supporting holes so as not to freely come out of the through-groove.

4,409,576

METHOD AND APPARATUS WHICH CHANGE MAGNETIC FORCES OF A LINEAR MOTOR

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

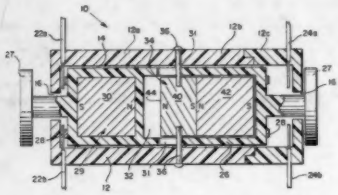
Filed Feb. 3, 1982, Ser. No. 345,232
Int. Cl.³ H01H 9/20, 36/00
U.S. Cl. 335—170 12 Claims

1. A magnetic apparatus comprising:

first and second means aligned in and spaced apart along a given direction and being operable for establishing first and second magnetic fields having predetermined strengths with like poles facing each other along said given direction;

and said first means including magnetically permeable material having a distal end face in facing relation to an op-

posed end face of said second means, said material having a given permeability and relatively easily demagnetizable relative to said fields and being of short enough length which, when said second means is in remote proximity to said material, will permit the magnetic field of said first means to extend at least to said distal end face of said material and of great enough length which, when said second means is in close proximity to said material, will



permit substantially all of the magnetic field of said first means to pass through side surfaces of said material whereby as the distance along said given direction between said first and second means is varied, an attractive force exists between said second means and said material when said end face of said second means is within a given distance of said distal end of said material and a repulsive force exists when said end face of said second means is greater than said given distance.

4,409,577

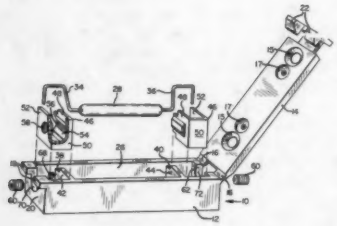
SWITCH HOUSING HAVING RECESSED CONDUCTOR TERMINALS

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Jun. 8, 1981, Ser. No. 271,574

Int. Cl.³ H01H *45/04*

U.S. Cl. 335—202 **11 Claims**



10. A magnetically actuated switch unit for use in a security alarm intrusion detection circuit and the like, comprising:

(a) an elongate body having a pair of opposite ends and defining cavity means therein for receiving an electrical component;

(b) a pair of terminal clamps, one of said clamps being located at each of said opposite ends of said elongate body;

(c) a magnetic contact switch mounted in said cavity means, said magnetic contact switch having a pair of leads, each of said leads being electrically connected to one of said terminal clamps;

(d) conductor aperture means defined in said body for receiving circuit conductors therethrough;

(e) means for holding said terminal clamps in predetermined positions with respect to said conductor aperture means;

(f) gripping means included in each of said terminal clamps for electrically connecting a circuit conductor to a respective one of said terminal clamps; and

(g) an end wall at each of said opposite ends of said body, each end wall defining a terminal access aperture providing operative access to the respective one of said gripping means.

4,409,578

COLOR DISPLAY TUBE COMPRISING A DEFLECTION YOKE AND DEFLECTION YOKE FOR A COLOR DISPLAY TUBE

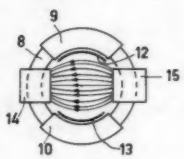
Wilhelmus A. J. Beelaard, and Nicolaas G. Vink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1980, Ser. No. 199,791

Claims priority, application Netherlands, Nov. 1, 1979, 7908000

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—210 **10 Claims**



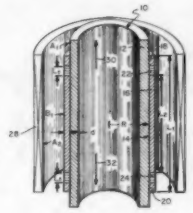
1. A color display tube having three electron guns situated in one plane for emitting three electron beams towards a display screen and having a deflection device which is mounted around a neck part of the display tube and also having a deflection yoke comprising a substantially cylindrical core of a magnetizable material the diameter of which at one end is smaller than that at the other end, a first deflection coil for generating, upon energization, a line deflection magnetic field, and a second deflection coil for generating, upon energization, a field deflection magnetic field, which second deflection coil consists of two substantially symmetrical coil halves which are axially wound and which are provided toroidally on the core, each of said second deflection coil halves occupying an angular amount on said core of between 70° and 90°, said second deflection coil having a winding distribution for generating a field deflection magnetic field of substantially pin-cushion shape throughout the length of the core, a first deflection device provided at the end of said core having the smaller cross-section, said first device changing the magnetic field of the second deflection coil from pin-cushion to barrel-shape, said first device comprising two members of magnetically permeable material which are provided substantially parallel to the direction of the field deflection magnetic field, symmetrically with respect to the axis thereof, inside said core adjacent the end having the smaller diameter, and a second deflection device comprising two blocks of magnetically permeable material placed diametrically opposite to each other on the axis of the field deflection magnetic field, which blocks are situated in the regions of stray magnetic field produced by said second deflection coil at the end of said core having said smaller diameter.

4,409,579

SUPERCONDUCTING MAGNETIC SHIELDING APPARATUS AND METHOD

John R. Clem, Ames, Iowa, assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 9, 1982, Ser. No. 396,556
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 19 Claims



1. An apparatus for providing a magnetic shield around a working volume, comprising:

(a) first cylinder of superconducting material surrounding said working volume, said first cylinder having an axis, a circumference, a central portion of predetermined magnetic pinning properties, end portions of higher magnetic pinning properties, and transition regions interposed between said central and said end portions, said transition regions having a predetermined length and magnetic pinning properties which vary monotonically along the length of said transition regions:

(b) first current means for generating circumferentially-directed currents in said first cylinder; and

(c) second current means for generating axially-directed currents in said first cylinder.

4,409,580

SOLENOID ACTUATOR FOR ELECTROMAGNETIC VALVE

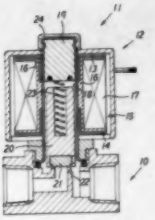
Tsuneo Ishigaki, Sugito, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

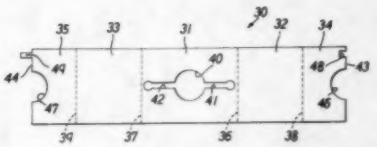
Filed Oct. 29, 1981, Ser. No. 316,531
Claims priority, application Japan, Jan. 8, 1981, 56-1117[U]
Int. Cl.³ H01F 7/10
U.S. Cl. 335—243 4 Claims

1. A solenoid actuator for an electromagnetic valve, comprising:

a coil body having at an axial center portion thereof a stationary core and a movable core; and

a magnetic frame within which said coil is housed and which further comprises an integral one-piece bent magnetic frame plate having an end plate which abuts against a first end face of said coil body, a first and second side plate integrally extending from said end plate for covering side portions of said coil body and a first and second half end plate integrally extending from each of the side plates, respectively, for covering a second end face of said coil body, wherein mating end edge portions of each of said half end plates each include a semi-circular notch formed therein, respectively, at a center portion of said mating end edge portions to define a through hole within which said stationary core is mounted and a respective concave and convex connecting portion engageable with each other and formed at opposing portions of said mating end edge portions, said mating end edge portions of said half





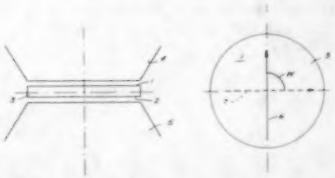
end plates being opposed to each other so as to form at least one slit for eliminating eddy current therebetween.

4,409,581

PROCESS AND APPARATUS FOR MAGNETIZING, ON BOTH SIDES, THE SURFACES OF BODIES TO BE MAGNETIZED

Franz Reumann, Baden, Austria, assignor to Internationale Patente Verwertungsgesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 927,524, Jul. 24, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 166,089
Claims priority, application Austria, Jul. 28, 1977, 5576/77
Int. Cl.³ H01F 13/00
U.S. Cl. 335—284 2 Claims



2. Apparatus for magnetizing two opposite sides of a body of magnetizable material comprising two magnetizing heads arranged at a spaced relationship opposite one another to receive said body therebetween; means for rotating magnetization vectors of said heads relative to one another by a compensating angle in accordance with the equation

$$z = \arcsin\left(\frac{\sin x \cdot \sin w}{\sin (w - x)}\right)$$

where

z is the compensating angle of each vector with respect to the intended position of that vector in the magnetised body,

x is the error angle of each vector with respect to its intended position when no angular compensation is made, and

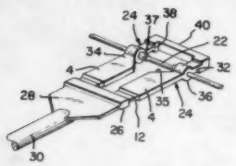
w is the angle included between the two magnetisation vectors in their intended position in the magnetised body.

4,409,582

ELECTRICAL FUSE AND METHOD OF MAKING SAME

David J. Kimmel, Clearwater, and John H. F. Lauterbach, New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 2, 1982, Ser. No. 384,358
Int. Cl.³ H01H *85/16*
U.S. Cl. 337—231 **12 Claims**



1. An electrical fuse of the type comprising a pair of parallel spaced-apart conductors, each of the conductors having a supported portion and a flat blade portion, the supported portions being supported in an insulating body, the blade portions extending from one end of the insulating body, and a fuse metal link having its ends connected to the supported portions and being at least partially continued in the insulating body, the fuse being characterized in that:

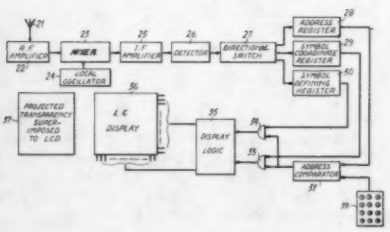
the spaced-apart conductors are of die cast metal and the insulating body is molded onto the spaced-apart conductors.

4,409,583

VIDEO SYSTEM FOR ASSISTING AUTOMOBILE TRAFFIC EMPLOYING A SEGMENTED LCD DISPLAY

Pierre-Louis Dahan, 106, Bd. Pereire, Paris, France 75017, and Phac Letuan, 5, Parc de la Bievre, L'Hay-les-Roses, France 94240

Continuation-in-part of Ser. No. 236,991, Feb. 23, 1981. This application May 21, 1981, Ser. No. 265,977
Int. Cl.³ G08G *1/00*; G09G *3/18*
U.S. Cl. 340—22 **5 Claims**



1. Radio system for video display of a map and symbols traced on said map comprising:

means for radio transmitting a plurality of digital messages, each including the address of a map among a plurality of maps, the definition of symbols among a plurality of symbols and the coordinates of said symbols on said map;

a display device having a plurality of points defined by coordinates and which can be selectively activated;

a plurality of transparent views representing said maps and having addresses assigned thereto;

means for selecting from among said view plurality the view having a given address;

means for projecting the selected view on to said display device;

means for selecting from among said address message-plurality the message including a map address equal to said selected view address; and

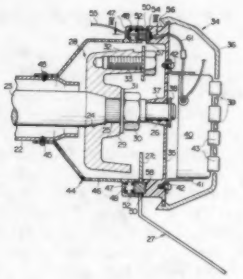
display logic means for activating selected points of the display device in response to the definition and coordinates of the symbols contained in the selected message.

4,409,584

INSTRUMENT PANEL SUPPORTING STRUCTURE

Sumitsugu Arima, Yokosuka; Harutoshi Tsujimura, and Yukio Fukunaga, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 31, 1981, Ser. No. 288,779
Claims priority, application Japan, Aug. 13, 1980, 55-114597[U]
Int. Cl.³ G08G *1/00*; G05G *11/00*
U.S. Cl. 340—22 **6 Claims**



1. An instrument panel supporting structure for a steerable vehicle including a body structure having a fore-and-aft direction, comprising:

a hollow steering column tube held stationary with respect to said body structure,

a steering shaft axially extending in and through said steering column tube and having a rear end portion, the steering shaft having a center axis therethrough and being rotatable about the center axis with respect to the steering column tube,

a steering wheel rotatable with the steering shaft about said center axis and including at least one spoke portion extending substantially radially away from said center axis,

a first support member mounted on the rear end portion of the steering shaft and rotatable about said center axis with respect to both the steering column tube and the steering shaft,

a second support member fixed with respect to said steering column tube,

one of the first and second support members having a plurality of recesses arranged circumferentially about said center axis and open in directions parallel with said center axis and the other of said first and second support members being formed with a plurality of cavities arranged circumferentially about said center axis and open toward and in alignment with said recesses, respectively,

said spoke portion partly intervening between said first support member and said second support member so as to intervene between any one of said recesses and correspondingly aligned cavities when the steering wheel assumes a predetermined angular position about said center axis with respect to said steering column tube,

a plurality of slidable members respectively movable through said cavities toward and away from said recesses,

each of said slidable members having a tapered end portion so as to be moved by said spoke portion, and

biasing means urging each of said slidable members to project into each of said recesses so as to have the tapered end portion of each slidable member received in each of the recesses, said slidable members comprising a first group of members each having a tapered end portion provided with an electric contact element and a second group of members each of which is devoid of an electric contact element, said recesses comprising a first group of recesses each having an electric contact element embedded therein and formed with a recess provided with a contact element for receiving and contacting each of said first group of slidable members and a second group of recesses each of which is devoid of an electric contact element, each of the contact elements of said first group of slidable members being urged by said biasing means to establish electrical connection with each of the contact elements in said first group of recesses.

4,409,585

SYSTEM GOVERNING THE POSITION OF A SENSOR

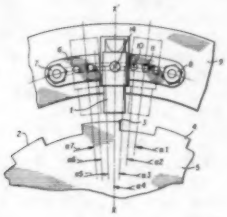
Christian Rousseau, Antony, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 17, 1981, Ser. No. 244,739

Claims priority, application France, Mar. 28, 1980, 80 06952

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—52 R **4 Claims**



1. A sensor comprising:

an electromagnetic sensor body;

a movable target fixed to a crankshaft of an internal combustion engine, said target being constructed and adapted to electrically influence said sensor when passing before said sensor body without contacting any element mechanically connected to said sensor body;

a bar having a circular arcuate longitudinal axis, said axis being parallel to the path of said target;

means for fixing said bar to a clutch bell housing for said engine such that said bar is stationarily fixed adjacent said target; and

means defining a plurality of discrete predetermined adjustment positions for said sensor body along said axis, whereby said sensor body may be fixed to said bar at a selected one of said adjustment positions so that the angular position and velocity of said crankshaft can be detected.

4,409,586

TIRE CONDITION MONITOR CONVERTER

Peter A. Hochstein, 14020 Fifteen Mile Rd., Sterling Heights, Mich. 48077

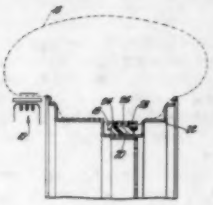
Filed May 26, 1981, Ser. No. 267,261

Int. Cl.³ B60C *23/02*

U.S. Cl. 340—58 **7 Claims**

1. A tire condition monitor converter assembly comprising;

a circular mounting means for engaging a vehicle wheel rim, a plurality of coils of wire extending about said mounting means, and terminl means for deposition on the wheel rim with said mounting means and including a first capacitor connected to a first number of said coils of said wire about said mounting means to define a first LC circuit and a second capacitor connected to a second number of said coils of said wire about said mounting means to define a second LC circuit, said first number of coils being different than said second number of coils, a harmonic multiplier supported by said mounting means and interconnecting said one of said coils of said first LC circuit



with one of said coils of said second LC circuit at a position about the circumference of said mounting means so that said first LC circuit is resonant to a first frequency and said second LC circuit is resonant to a different second frequency, a switch supported by said terminal means and connected to said LC circuits for actuating upon sensing a predetermined tire condition.

4,409,587

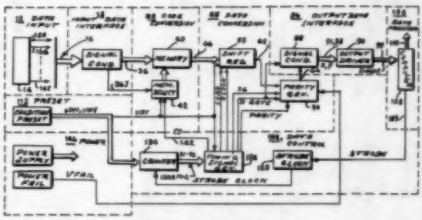
ALTIMETER CODE CONVERTER

Robert G. Scott, Quincy, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,031

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **3 Claims**



1. An altitude code converter that has input a parallel signal being Gray coded for altitude information and that outputs a binary serial word acceptable to a computer comprising:

an input data interface connected for receiving the altitude information coded parallel signal and connected for outputting an adjusted parallel signal having a plurality of adjusted bit signals, said input data interface having a plurality of adjusting circuits equal in number to the number of bit signals of the parallel signal, each of said adjusting circuits having buffer amplifying means therein;

a conversion device connected for receiving the adjusted parallel signal output from said input data interface and connected for outputting a binary serial signal, said conversion device including a code conversion circuit for converting the adjusted parallel signal to a binary parallel signal representing actual altitude in binary notation, said code conversion circuit being memory means having a lookup table therein, said memory means addressed by a plurality of said adjusted bit signals and outputting a 16 bit binary parallel signal having a decimal equivalent value of an altitude input to said altitude code converter in Gray

code, and a memory select circuit connected for selecting read-only memories to be addressed; a data conversion circuit for receiving the binary parallel signal and outputting a binary serial signal having a predetermined bit length and having a parity bit inserted therein, said data conversion circuit including at least one parallel-to-serial shift register for outputting a 32 bit serial signal without parity and a parity generator connected for inserting a parity bit into said 32 bit serial signal; and a data control circuit for outputting timing signals to said code conversion circuit and said data conversion circuit, said data control circuit including a pair of counters connected for having input initializing signals from said condition present circuit and a strobe signal from said computer and outputting a plurality of counting signals to a timing signal generator comprising a plurality of gates and inverters, said timing signal generator outputting a clock signal, a data gating signal during a data shift period, a data enable signal, a parity signal, a chip select signal, and a load signal;

an output data interface connected for receiving the binary serial signal and for outputting said binary serial computer word;

a condition preset circuit connected for initializing said conversion device;

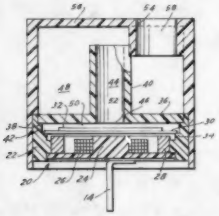
means for powering, said means for powering including a circuit connected for providing a plurality of fixed voltages to said code converter and a circuit connected for indicating external power failure to said conversion device.

4,409,588

MINIATURE SOUNDER WITH MULTI-PART TUNED CAVITIES

Alan Hofer, Wantaugh, and Frank M. Yama, Massapequa, both of N.Y., assignors to Pickering & Company, Inc., Plainview, N.Y.

Filed Mar. 10, 1981, Ser. No. 242,347
Int. Cl.³ G08B *3/10*
U.S. Cl. 340—384 R **5 Claims**



1. A miniature sounder comprising:

a diaphragm;

a surrounding housing disposed about said diaphragm;

an open-ended chamber dimensioned to resonate at a predetermined frequency positioned within said housing, said chamber having a first portion including a first open end closed by said diaphragm and a second portion including an opposite open end communicating with the interior of said housing;

an armature affixed to said diaphragm;

a magnetic circuit operatively connected to said armature for driving said diaphragm at a desired frequency; and,

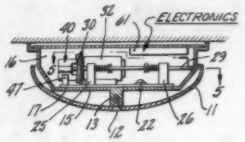
an open-ended enclosure positioned within said housing providing an outlet from said sounder; said open-ended chamber having a volume tuned to a subharmonic of said desired frequency and said open-ended enclosure and housing having a combined volume tuned to said desired frequency.

4,409,589

ADJUSTABLE ELECTRIC BELL

Louis J. Finkle, Bellflower, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 16, 1981, Ser. No. 312,433
Int. Cl.³ G08B *3/00*
U.S. Cl. 340—396 **6 Claims**



1. An electrically powered bell assembly comprising:

a bell;

a base structure fixed relative to said bell;

a support plate adjustably attached to said base structure for adjustable alignment relative to said bell; and

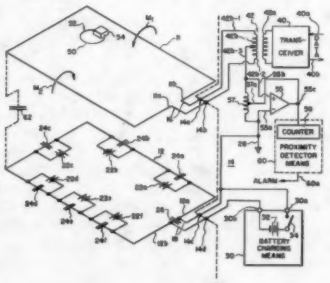
a hammer assembly mounted on said plate and adapted to strike said bell, said hammer assembly including a hammer slidably mounted to impact against said bell, an electric motor, an annular cam plate operatively interconnected to said motor for rotation thereby, said cam plate having a circular cam surface formed on one side thereof, said cam surface including at least one step in the shape thereof, a follower attached to said hammer and aligned to ride on said cam surface and spring means deployed between said hammer and said support plate for urging said hammer to an equilibrium position relative to said bell.

4,409,590

BUILDING SECURITY, COMMUNICATION AND CONTROL SYSTEM

Lewin T. Baker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1981, Ser. No. 305,867
Int. Cl.³ G08B *1/08*
U.S. Cl. 340—533 **10 Claims**



1. A system for providing perimeter security, intra-building communication and power to powering means in each of at least one functional unit in a building, comprising:

first and second conductive loops placed about the building periphery and spaced from one another;

means coupled to said first and second loops for detecting an intruder in proximity to said building periphery;

data transceiver means coupled to a first one of said loops for transmitting data to, and for receiving data from, the interior of said building by magnetic induction; and

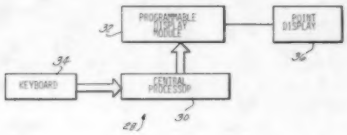
means for providing power to those of said functional unit powering means connected in series with said second loop.

4,409,591

VARIABLE SIZE CHARACTER GENERATOR

Mark D. Simkovitz, Oak Park, Mich., assignor to Wayne State University, Detroit, Mich.

Filed May 20, 1981, Ser. No. 265,371
Int. Cl.³ G06F 3/14
U.S. Cl. 340—731 **31 Claims**



1. An apparatus for generating variable size, point display characters comprising:

means for selecting a character to be displayed;

means for selecting one of a predetermined number of distinct character sizes for the selected character;

character generator means, responsive to the means for selecting a character and the means for selecting a character size, for generating the selected character having the selected one of a predetermined number of distinct sizes, the character generator means comprising:

first memory means for storing first binary codes assigned to each distinct geometric pattern disposed in a block element of a character matrix defining each character to be displayed on a row-by-row, column-by-column basis;

first means for addressing the first memory to output therefrom selected ones of the first binary codes corresponding to the selected character on a row-by-row, column-by-column basis of the selected character matrix;

first means, responsive to the output of the first memory means, for generating second binary codes corresponding to the sequence of binary states of the points defining the point matrices of each block element of the selected character on a line-by-line basis for each block element, the second binary codes corresponding to the selected one of the predetermined number of distinct character sizes; and

second means, responsive to the second binary codes, for generating binary sequences of signals on a point-by-point basis for generating the selected character having the selected character size.

4,409,592

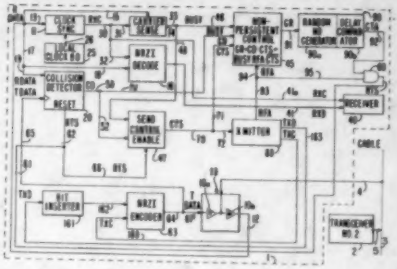
MULTIPOINT PACKET DATA COMMUNICATION SYSTEM USING RANDOM ACCESS AND COLLISION DETECTION TECHNIQUES

V. Bruce Hunt, 2070-B Liberty Park Ave., Menlo Park, Calif. 94025

Filed Apr. 20, 1981, Ser. No. 255,448
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.5 **13 Claims**

1. In a data communication system having a communication channel for interconnecting a plurality of transceivers, each of said transceivers including means for transmitting a signal having transitions, the improvement comprising:

means responsive to the presence and absence of a signal on said communication channel during a transition of a signal transmitted by said transmitting means for providing a collision detected (CD) signal if no signal is detected on said communication channel during a transition of said transmitted signal; and



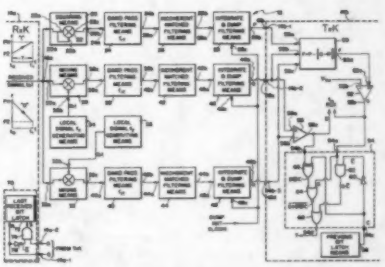
means responsive to said CD signal for terminating said transmitting of said signal.

4,409,593

THRESHOLD-LESS COLLISION DETECTION AND BIT ARBITRATION IN A CFSK DATA SYSTEM

Sanjay K. Bose, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,707
Int. Cl.³ H04Q 9/00; H04J 6/00
U.S. Cl. 340—825.5 **15 Claims**



1. A method for collision detection in a chirped-frequency-shift-keyed (CFSK) data system having a common system communications medium and a plurality of data stations each containing a data transmitter and a data receiver, comprising the steps of:

identifying each of a successive plurality of synchronous bit time intervals during which at least one of the plurality of data stations transmitters may transmit a bit of digital data over the common system communications medium;

constantly monitoring the common system communications medium with each data station receiver even while the transmitter of the same data station is transmitting digital data;

subjecting the signal received by each data station receiver to a plurality of processing operations each in a respective one of a like plurality of channels; and

comparing the energy contents of the outputs of the plurality of channels to detect if a data transmission colision has occurred.

4,409,594

APPARATUS FOR PERFORMING RADIO FREQUENCY PULSE MODULATION WITH AUTOMATIC MODULATION CONTROL

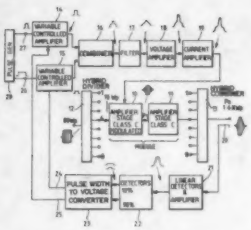
Danio Graziani, Milan, Italy, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,300

Claims priority, application Italy, Sep. 21, 1979, 25913 A/79

Int. Cl.³ G01S 1/44

U.S. Cl. 343—399 **10 Claims**



1. A radio-frequency pulse transmitting system such as DME or Tacan comprising:

first means including at least one radio-frequency amplifier responsive on a radio-frequency input to a pulse-modulated carrier signal and to a further-frequency video pulse on a control terminal for producing radio-frequency output pulses having predetermined envelope characteristics;

second means for discretely sampling said radio-frequency output pulses at a plurality of amplitude levels and for generating discrete modulation control signals each representing the duration of the envelope of said radio-frequency output pulses at a predetermined corresponding amplitude level;

third means for generating a plurality of separate video pulse trains synchronous with and of pulse duration not exceeding the pulses of said pulse-modulated carrier signal;

fourth means comprising a separate gain-controllable amplifier responsive to each of said second means modulation control signals and to a corresponding one of said third means video pulses to adjust the amplitude of said corresponding video pulse as a function of the corresponding control signal from said second means;

and fifth means for combining said video pulses from said third means to provide a train of pulses having peak amplitude substantially equal to the sum of the amplitudes of said video pulses from said third means, said combined pulse train being applied at said radio-frequency amplifier as said further-modulating pulse.

4,409,595

STRIPLINE SLOT ARRAY

Pyong K. Park, Canoga Park, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Continuation of Ser. No. 147,416, May 6, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,323

Int. Cl.³ H01Q 13/10

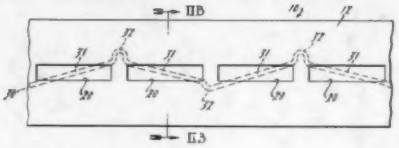
U.S. Cl. 343—771 **8 Claims**

1. A slot array antenna comprising:

a dielectric-filled electrically conductive box having four electrically conductive faces elongated along a longitudinal axis, each face having a width dimension orthogonal to the longitudinal axis, each cross-section of said box orthogonal to said longitudinal axis being substantially rectangular, whereby two of the faces have relatively narrow widths and two of the faces have relatively wide widths;

cut out of one of the relatively wide width faces, several collinearslots, each slot being aligned and elongated along a single long axis, said long axis being parallel to the longitudinal axis and bifurcating said cut face into two substantially equal halves; and

one continuous stripline feed conductor for exciting said slots, said conductor being imbedded within said dielectric, roughly disposed in the direction of said longitudinal axis, wherein said conductor comprises several segments



each of which is angled with respect to the long axis depending upon the desired amount of energy to be coupled from said segment to its nearest slot;

wherein the electrical width of each of said relatively wide width conductive faces is greater than one-half wavelength at the desired frequency of operation of said antenna.

4,409,596

METHOD AND APPARATUS FOR DRIVING AN INK JET PRINTER HEAD

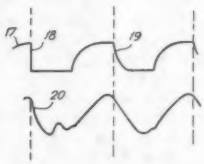
Hiroshi Ishii, Shiojiri, Japan, assignor to Epson Corporation, Nageno and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Aug. 11, 1981, Ser. No. 291,904

Claims priority, application Japan, Aug. 12, 1980, 55-110652; Aug. 25, 1980, 55-116727

Int. Cl.³ G01D 15/18

U.S. Cl. 346—1.1 **27 Claims**



1. A method of expelling ink droplets on demand from an ink jet printer head to effect printing, said head including a combination of a single pressure chamber, a nozzle, a flow path connecting said chamber to an ink source, a flow path connecting said chamber to said nozzle, and a transducer element associated with said single chamber, said transducer element when driven altering the internal volume of said pressure chamber, a driver circuit for driving said transducer element, comprising the steps of:

(a) generating driver pulses of a first waveform and amplitude in said driver circuit;

(b) continuously applying said pulses of said first waveform and amplitude to drive said transducer element when droplet expulsion is not desired;

(c) selectively generating a driving pulse of a second waveform and amplitude in said driver circuit whenever a droplet is demanded;

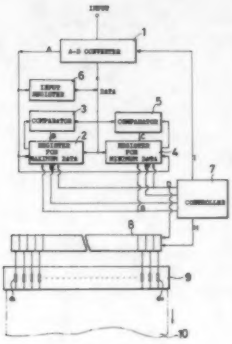
(d) applying said pulse of said second waveform after a pulse of said first waveform to drive said transducer element and to effect droplet ejection, only said pulse of said second waveform imparting sufficient energy to said transducer at a rate sufficient to cause a droplet to eject from said nozzle.

4,409,597

LINE PRINTER FOR RECORDING ANALOG SIGNALS

Kenji Nakamura, Takatsuki, and Shigeru Ideno, Kameoka, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 30, 1982, Ser. No. 363,626
Claims priority, application Japan, Jul. 30, 1981, 56-120393
Int. Cl.³ G01D 9/12, 15/10
U.S. Cl. 346—35 3 Claims



1. A line printer for recording analog signals, which comprises:

a plurality of printing elements arranged side by side in a row, said printing elements being located close to each other one after another;

an output head carrying said printing elements such that they are individually and selectively driven;

a paper feeding device allowing a paper to be fed perpendicularly to said row of said printing elements;

a register for storing the maximum data of all signals received for a given period of time;

a register for storing the minimum data of all signals received for said period of time, and

means for driving said output head so as to cause said printing elements to be driven at the same time correspondingly to said maximum data, said minimum data, and data interlocated therebetween.

4,409,598

MAGNETIC IMAGING

J. Kirk Swigert, Penfield, and Darlyn F. Pochan, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 25, 1980, Ser. No. 180,730
Int. Cl.³ G01D 15/12
U.S. Cl. 346—74.2 2 Claims

1. An improved magnetic imaging method comprising the steps of:

(a) creating a latent magnetic image on a flexible and movable magnetizable imaging member, wherein said magnetizable imaging member comprises a base or web having a solid coating of magnetizable material thereon and the magnetizable material having an overcoating of electroconductive material that is selected from the group consisting of aluminum, copper, nickel, cobolt, magnesium, tin, zinc, chromium, gold, silver, and mixtures or alloys thereof, said overcoating of electroconductive material being approximately 0.04 microns thick and having a surface resistivity of approximately 2 ohms per square;

(b) developing said latent magnetic image with toner having magnetic or magnetizable properties as said magnetizable imaging member is moved past a developing station, wherein the developed image lies on the surface of the electroconductive material;

(c) pressure transferring the developed image from the surface of the electroconductive material of the magnetizable imaging member to a receiving substrate by passing the magnetizable image member and the receiving substrate with the developed image therebetween through at least two rotatable pressure rolls which exert a linear pressure thereon of approximately 25 pounds per linear inch, whereby adhesive properties of the electroconductive material enable efficient release and transfer of greater than 90% of the developed image to the receiving substrate without damaging the imaging member and without toner residue buildup; and

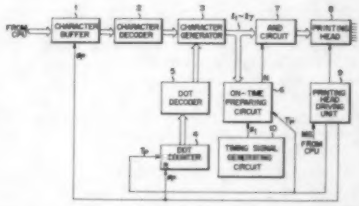
(d) fixing said developed image to said receiving substrate.

4,409,599

PRINTING CONTROL DEVICE FOR THERMAL PRINTER

Takeshi Yasuda, Fussa, and Kazuyoshi Watanabe, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,840
Claims priority, application Japan, Oct. 27, 1980, 55-149285; Oct. 27, 1980, 55-149286
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH 12 Claims



1. A printing control device for a thermal printer, comprising:

buffer means for storing data to be printed;

character generating means coupled to said buffer means for generating, in a parallel mode, dot data of a dot pattern which corresponds to data read out of said buffer means;

printing means including a thermal printing head section coupled to said character generating means and having n printing elements, said thermal printing head section being adapted to apply a predetermined voltage to given ones of said printing elements corresponding to the dot data to be printed, which dot data are generated from said character generating means; and

an on-time preparing circuit coupled to said thermal printing head section and to said character generating means including means for detecting, out of the dot pattern generated from said character generating means, the number of dots to be printed; and means for generating an on-time signal having a time width determined as a function of the number of detected dots, and for delivering said on-time signal to said thermal printing head section each time one dot printing is performed;

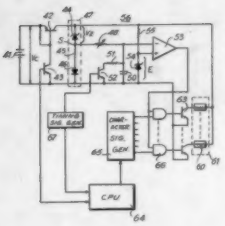
said printing means including means responsive to said on-time signal for controlling the time width of said predetermined voltage applied to the respective printing elements of said printing head section which correspond to the dot data to be printed.

4,409,600

THERMAL PRINTER DRIVE CIRCUIT

Masahiro Minowa, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan

Filed Dec. 28, 1981, Ser. No. 334,757
Claims priority, application Japan, Dec. 29, 1980, 55-187626
Int. Cl.³ G01D 15/10; B41J 3/20
U.S. Cl. 346—76 PH 13 Claims



1. A drive circuit for a thermal printer for printing characters on a printing sheet by selectively applying current to a plurality of heat generating elements, comprising:

current application control means for selectively controlling the application of current to said heat generating elements;

a power source supplying said current to said current application control means and to said heat generating elements;

time control means for varying the active operational period of time of said current application control means for energizing said heat generating elements, said time control means including:

a charging circuit having at least a first constant voltage means, a first resistor and a capacitor in series between the terminals of said power source; a discharging circuit connected in parallel with at least said capacitor of said charging circuit; and

switching means adapted to be ON or OFF according to a selected charge level of said capacitor, said switching means when ON enabling said current application control means to apply current to said heat generating elements, said switching means, when OFF, preventing said current application control means from applying current to said heat generating elements, the time required for said capacitor to charge to said selected level varying inversely with the voltage level of said power source, the temperature of said heat generating elements, when energized, being constant over a wide range of voltages of said power source.

4,409,601

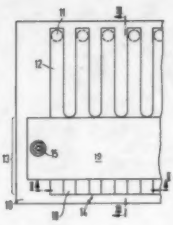
MOSAIC RECORDER WITH REDUCED MECHANICAL COUPLING

Kenth Nilsson, Akersberga, and Jan Bolmgren, Vaellingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,982
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114192
Int. Cl.³ G01D 15/18; B41J 3/04
U.S. Cl. 346—140 R 1 Claim

1. In a mosaic recorder having a plurality of nozzles through which a recording liquid is ejected for printing alphanumeric characters and images in punctiform representation on a moving recording medium, said nozzles being disposed adjacent one another in rows in a recording head, and each nozzle having an inlet opening, the improvement comprising:

a comb-like bilaminar piezoplate having a plurality of teeth respectively overlying said inlet openings of said nozzles, each tooth being a transducer for selectively causing a droplet of recording liquid to be ejected from the nozzle associated therewith, said piezoplate having a base portion which is clamped to said recording head, said piezoplate consisting of a layer of piezoceramic material and a carrier layer and having a base portion, the ceramic layer of said base portion of said piezoplate having a pluraity of gaps disposed in regions corresponding to extensions of the interstices between said transducer teeth,



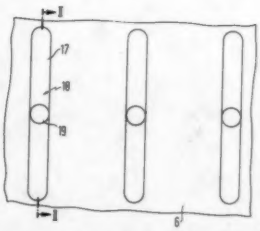
whereby said gaps substantially eliminate mechanical coupling between said transducer teeth such that actuation of one of said transducer teeth has substantially no influence on others of said transducer teeth.

4,409,602

MOSAIC RECORDER WITH IMPROVED NOZZLE STRUCTURE

Jan Bolmgren, Vaellingby; Bertil Hoek, Västeras, and Kenth Nilsson, Akersberga, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,987
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114259
Int. Cl.³ G01D 15/18; B41J 3/04
U.S. Cl. 346—140 R 10 Claims



1. In a mosaic recorder for printing characters and images on a moving recording medium in punctiform representation, said recorder having a recording head with a plurality of nozzles disposed in rows therein for respectively ejecting droplets of a recording liquid onto said recording medium, each said nozzle having a piezoelectric transducer associated therewith, each transducer being a tooth of a comb-like transducer plate mounted to said recording head, said transducers respectively forcing ejection of said droplets from said nozzles upon respective actuation of said transducers, the improvement comprising:

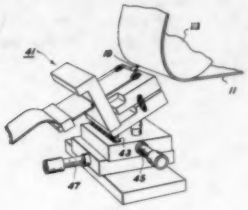
each of said nozzles having a generally oblong inlet opening tapering to a generally circular exit opening from which said droplet is ejected, said inlet opening of said nozzle being disposed substantially transversely to a row of said nozzles.

4,409,603

ELECTROGRAPHIC METHOD AND APPARATUS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1980, Ser. No. 219,180
Int. Cl.³ G01D 15/06
U.S. Cl. 346—155 10 Claims



1. An improved apparatus for applying a charge pattern to an insulating imaging member by a stylus array of the type wherein the styli of the array are in direct contact with the insulating imaging member, and the insulating imaging member and the styli move relatively with respect to each other, the improvement comprising:

an adjustable stylus array having each stylus in the array resiliently held into contact with the insulating imaging member;

means for applying a signal voltage to the styli in said array for production of a charge pattern on the insulating imaging member; and

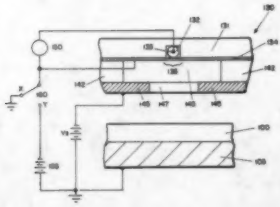
means for adjusting said stylus array to obtain a force of contact between the styli in the array and the insulating imaging member that is below the force of contact necessary to develop a triboelectric charge on the insulating imaging member because of the rubbing contact with the styli during relative movement between the styli and the insulating imaging member, so that there will be substantially no background charge on the insulating imaging member.

4,409,604

ELECTROSTATIC IMAGING DEVICE

Richard A. Fotland, Holliston, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jan. 5, 1981, Ser. No. 222,830
Int. Cl.³ G01D 15/06; H01J 7/24; H05B 31/26
U.S. Cl. 346—159 35 Claims



1. Electrostatic imaging apparatus, comprising:

an elongate conductor;

a dielectric sheath for said elongate conductor;

a conductive member transversely oriented with respect to said elongate conductor and contacting or closely spaced from said dielectric sheath;

a varying potential applied between said elongate conductor and said conductive member in order to generate ions in an air region adjacent the dielectric sheath and conductive member; and

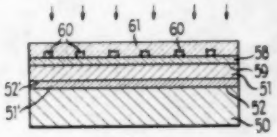
means for extracting ions from said air region to create an electrostatic image on a further member.

4,409,605

AMORPHOUS SEMICONDUCTORS EQUIVALENT TO CRYSTALLINE SEMICONDUCTORS

Stanford R. Ovshinsky, Bloomfield Hills, and Arun Madan, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 222,489, Jan. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 104,284, Dec. 17, 1979, abandoned, which is a division of Ser. No. 887,353, Mar. 16, 1978, Pat. No. 4,226,898. This application Sep. 29, 1982, Ser. No. 427,688
Int. Cl.³ H01L 45/00
U.S. Cl. 357—2 39 Claims



1. A semiconductor film comprising a solid amorphous semiconductor host matrix including at least one element and having elecronic configurations which have an energy gap and a density of localized defect states therein, said host matrix including at least one element being formed by the glow discharge decomposition of a compound containing said at least one element and at least one compensating or alterant element in a partial vacuum having an atmosphere separately containing at least one different compensating or alterant element and not derived from the compound, wherein one of said different at least one compensating or alterant element of said compound and element separately contained in said atmosphere comprises at least fluorine and wherein both of the same were incorporated in said amorphous semiconductor host matrix during deposition thereof yielding compensated or altered amorphous semiconductor material having altered electronic configurations with a reduced density of localized defect states in the energy gap.

4,409,606

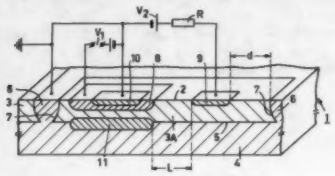
HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Kornelis J. Wagenaar, Nijmegen; Hendrik C. De Graaff, and Johannes A. Appels, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1981, Ser. No. 223,199
Claims priority, application Netherlands, Mar. 10, 1980, 8001409
Int. Cl.³ H01L 29/90
U.S. Cl. 357—13 12 Claims

1. A semiconductor device having a semiconductor body comprising a surface-adjoining semiconductor layer of a first conductivity type which is situated on a substrate region of the second opposite conductivity type and forms a p-n junction therewith, a separation region which extends from the surface over substantially the whole thickness of the semiconductor layer and surrounds an island-shaped region of the semiconductor layer, within which island-shaped region are present an active zone of the second conductivity type belonging to a semiconductor circuit element and a juxtaposed contact zone of the first conductivity type having a higher doping concentration than the semiconductor layer, the active zone and the contact zone both adjoining the surface and at least the contact

zone being further surrounded entirely by the island-shaped region, the thickness and the doping concentration of the island-shaped region being so small that upon applying a voltage in the reverse direction across the p-n junction, the depletion zone extends up to the surface at a voltage which is lower than the breakdown voltage of the p-n junction, characterized in that between the semiconductor layer and the substrate region a buried layer of the first conductivity type is present having a higher doping concentration than the semiconductor



layer and extending at least below at least a portion of the said active zone and is separated from the active zone by the island-shaped region, in which, in projection, the distance in μm between the edge of the buried layer and the edge of the contact zone is at least equal to

$$2V_B/E_c$$

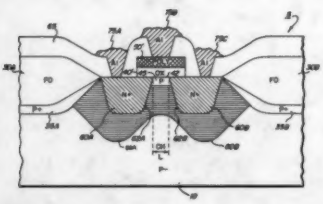
wherein E_c is the critical field strength in volts per μm above which avalanche multiplication occurs in the semi-conductor layer, and V_B is the breakdown voltage in volts of the p-n junction.

4,409,607

NORMALLY-ON ENHANCEMENT MODE MOSFET WITH NEGATIVE THRESHOLD GATING

Vladimir Rumennik, Playa Del Rey, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 25, 1980, Ser. No. 172,338
Int. Cl.[3] **H01L** *27/02, 29/12, 29/78*
U.S. Cl. 357—23 **1 Claim**



1. A Normally-On enhancement mode MOSFET having a gate threshold voltage for nonconduction comprising:

a semiconductor substrate of a first conductivity type, said substrate being very lightly doped such that it has a relatively very high resistivity of at least 300 ohm centimeters,

a heavily doped source region and a heavily doped drain region provided at a surface of said substrate, said regions being of a second conductivity type whereby source and drain junctions are provided, each of said junctions having a depletion region associated therewith due to the built-in potential of the junction, said depletion regions extending substantially into said substrate due to the very light doping of said substrate,

and an insulated gate electrode coupled to said surface of said substrate adjacent said source and drain regions,

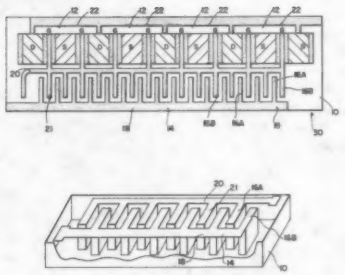
said source and drain regions being separated by a substrate channel of a length not greater than about one micron whereby said depletion regions associated with said junctions overlap in said channel from source region to drain region due to the substantial extension of said depletion regions into said substrate, the electric field associated with the overlapped depletion regions being of sufficient magnitude to create an inversion layer of said second conductivity type in said channel extending from source region to drain region, said surface inversion layer providing a conduction path through said channel as between said source and drain regions such that said MOSFET is normally in the conduction mode without application of said threshold gate voltage for nonconduction to said gate electrode.

4,409,608

RECESSED INTERDIGITATED INTEGRATED CAPACITOR

Max N. Yoder, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1981, Ser. No. 258,345
Int. Cl.[3] **H01L** *27/02, 29/06, 23/48, 29/44*
U.S. Cl. 357—51 **3 Claims**



1. An integrated circuit comprising:

a semiconductor substrate having first and second spaced apart surfaces and a resistivity of the material of the substrate being greater than 10^4 ohm-centimeters;

a first plurality of spaced apart electrodes embedded within the bulk of the substrate between the first and second surfaces;

a second plurality of spaced apart electrodes embedded within the bulk of the substrate between the first and second surfaces, the ones of the first electrodes alternating with the ones of the second electrodes along the plane of the substrate;

at least one electronic member formed within the substrate;

means interconnecting the first plurality of electrodes and the electronic member and disposed proximal the first surface; and

means interconnecting the second plurality of electrodes and disposed proximal the first surface;

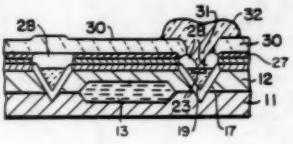
the first and second plurality of electrodes being metallized members forming interdigited opposite electrodes of a capacitor with a dielectric thereof being the substrate material.

4,409,609

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Takeshi Fukuda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 18, 1981, Ser. No. 244,952
Int. Cl.³ H01L 29/06, 29/04, 27/12
U.S. Cl. 357—55 3 Claims



1. A selected interconnection between a plurality of semiconductor devices on a substrate, comprising

said semiconductor substrate having a first conductivity type,

a semiconductor layer of a second conductivity type opposite to the first conductivity type, the layer being formed on the substrate,

a V-groove for selectively separating said devices, penetrating through the semiconductor layer, and reaching into the substrate,

an insulating film formed on the surface of the V-groove,

a polycrystalline semiconductor layer formed in the V-groove on the insulating film,

a single crystal semiconductor region formed along a surface portion of the polycrystal semiconductor layer, and

a metal wiring layer formed to selectively contact with the single crystal semiconductor region and said devices.

4,409,610

METHOD FOR REPRODUCING POLYCHROME IMAGES

Walter Jaeger, Cureglia, Switzerland, assignor to GX-Holding AG, Basel, Switzerland

Filed Nov. 25, 1980, Ser. No. 210,353
Claims priority, application Switzerland, Nov. 29, 1979, 10614/79
Int. Cl.³ H04N 9/34
U.S. Cl. 358—12 10 Claims

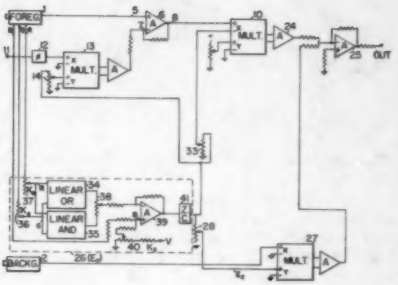
1. Method for reproducing polychrome moving images from an electric video signal sequence, characterized by the use of a video signal sequence which corresponds to an image scan and image reproduction with a line raster and the line by line video signal sequence comprises alternately a first and a second signal of which the first signal, at least in portions of a line, corresponds to a first colour separation and that the second signal, in portions of a line and sequentially, corresponds to at least two different other colour separations of the image original, that at least the first signal is repeated at least once by repetition and delayed by at least one field period and that at least the second signal is divided into signal components associated with its colour separations and that the first signal as well as the signal components of the second signal are converted into luminous image traces of different colour.

4,409,611

ENCODED SIGNAL COLOR IMAGE COMPOSITING

Petro Vlahos, Tarzana, Calif., assignor to Vlahos-Gottschalk Research Corp., now Ultimatte Corp., Reseda, Calif.

Filed Sep. 24, 1981, Ser. No. 305,073
Int. Cl.³ H04N 9/535
U.S. Cl. 358—22 19 Claims



1. The method of compositing color image video signals involving a colored backing, which comprises the method steps of;

(a) forming a control signal E_b as a linear function of the red, green and blue video components of the foreground scene in accordance with the equation;

$$E_b = K[(B-G)-K_1(G-R)^+ - K_2(R-G)^+]^+,$$

(b) generating a chroma vector and adjusting the phase angle of the generated vector to match the phase angle of the vector representing the colored backing in the foreground scene video signal,

(c) removing the chroma of the colored backing by vector subtraction in which the amplitude of the generated vector is controlled by E_b and where K is initially adjusted to match vector amplitudes,

(d) removing the spurious chroma from the foreground subject caused by illumination of the subject by colored light from the backing by setting K_1 to unity and K_2 to zero in the E_b equation,

(e) forming a control signal E_c as a linear function of the red, green and blue video components of the foreground scene in accordance with the equation;

$$E_c = K_1[B-K_2(K_3R \text{ OR } K_4G)+(1-K_2)(K_3R \text{ AND } K_4G)-K_5(1-B)]^+,$$

(f) arithmetically subtracting E_b and E_c in a selected proportion from the foreground scene video signal at an amplitude that results in zero luminance over the area of the colored backing,

(g) linearly controlling the level of the background image video signal in proportion to the amplitude of control signal E_c,

(h) combining by arithmetic addition the foreground scene video signal from which has been removed the chroma and luminance of the colored backing, with the background scene video signal whose level has been controlled by E_c.

4,409,612

CIRCUIT ARRANGEMENT FOR SEPARATING THE COMPONENTS OF A PAL COLOR TELEVISION SIGNAL

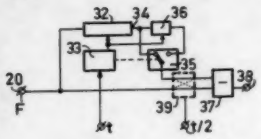
Leo Warmuth, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,308

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035647

Int. Cl.³ H04N *9/50*

U.S. Cl. 358—24 **2 Claims**



1. A circuit arrangement for separating the components of a PAL-colour television signal, in which the composite chrominance signal is applied through a first path and through a second path delayed by substantially one line period or a multiple thereof relative to the first path to respective inputs of a first and second combining stage, particularly an adder or a subtracting stage, from the outputs of which the separated chrominance signal components can be derived, said circuit arrangement comprising:

a first and second delay device in said second signal path, and

a first and second combining device having their inputs connected respectively to said first and second signal paths,

said delayed signal being applied to said first combining stage through said first delay device producing a time delay of, 283.5 chrominance subcarrier periods and to said second combining stage through said first and second delay devices, said second delay device producing a time delay of 0.5 chrominance subcarrier period.

4,409,613

SEPP-BASED DEFLECTION CONTROL CIRCUIT

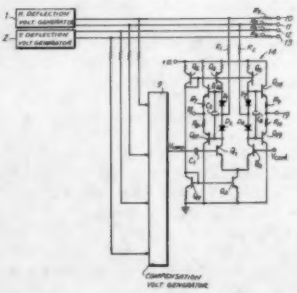
Takashi Nakamura; Yoshihiro Morioka; Kazunori Yamaji, all of Atsugi, Japan; Takashi Nakamura; Yoshihiro Morioka, and Kazunori Yamaji, all of Atsugi, Japan, assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 3, 1982, Ser. No. 354,307

Claims priority, application Japan, Mar. 4, 1981, 56-31004

Int. Cl.³ H04N *9/09*

U.S. Cl. 358—51 **10 Claims**



1. Apparatus for correcting scanning of an electron beam which is scanned in respective horizontal and vertical directions in at least one pickup tube of a television camera having a plurality of pickup tubes; comprising

a source of horizontal and vertical deflecting signals having respective outlets supplying said deflecting signals;

means for supplying said horizontal and vertical deflecting signals to respective horizontal and vertical deflection inputs of a predetermined one of said pickup tubes;

compensating voltage generating means having an input coupled to receive said horizontal and vertical deflecting signals and outputs providing respective deflection compensating voltages for selected ones of said pickup tubes; and

combining means for combining said respective deflection compensating voltages with corresponding ones of said horizontal and vertical deflecting signals to generate adjusted horizontal and vertical deflecting signals for application to the horizontal and vertical deflection inputs of said selected pickup tubes; said combining means including

transistor means having an input electrode coupled to receive the associated deflection compensating voltage and an output electrode coupled through a load resistor to one of said outputs of said source of horizontal and vertical deflecting signals; and

a pair of complementary transistors arranged in single-ended push-pull configuration, said complementary transistors having bases coupled to said output electrode of said transistor means and emitters coupled through respective emitter resistors to one of the deflection inputs of one said selected pickup tubes.

4,409,614

METHOD FOR THE REPRODUCTION OF ORIGINALS WHICH, WITH RESPECT TO THEIR COLOR CONTENT, ARE SCANNED ACCORDING TO A TRISTIMULUS METHOD

Helmut Eichler, Burgunderstr. 13, D-7601 Durbach; Friedrich W. Vorhagen, Am Wald 44, D-5190 Stolberg-Atsch, and Hans M. Hütten, Helleter Feldchenstr. 10, D-5102 Würselen-Broichweiden, all of Fed. Rep. of Germany

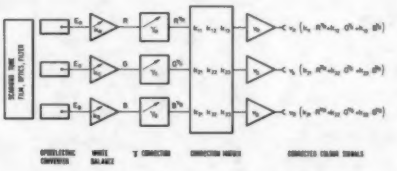
Continuation of Ser. No. 192,953, filed as PCT DE79/00121 on Oct. 9, 1979, published as WO80/00753, Apr. 17, 1980, § 102(e) dated Jun. 6, 1980, abandoned.

This application Dec. 7, 1981, Ser. No. 328,157

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844158

Int. Cl.³ G03F *3/08*

U.S. Cl. 358—76 **72 Claims**



1. Method for reproduction of originals, including originals of non-metameric colour composition, where the original is scanned in each case, with respect to its colour content, according to a tristimulus method and after processing of the scanning signals a reproduction is obtained, via colour mixture, by means of a predetermined colour rendition system, characterized in that the scanning signals (E_R,E_G,E_B) are converted, into three primary colour signals (e.g. X, Y, Z) having actual colour values in a predetermined colour coordinate system corresponding substantially identically to theoretical colour values of the original, and that adaptation of the primary colour signals or the signals deriving from these to at least one colour rendition system and/or measures to alter the gradation and/or objective measures to alter the colour rendition of individual colours in the overall image or in discrete areas of

the image and/or any other further non-linear processing of the primary colour signals or the signals deriving from these are only carried out after said scanning signals have been converted into the primary colour signals having actual colour values in said predetermined colour coordinate system corresponding substantially identically to said theoretical colour values of the original.

4,409,615

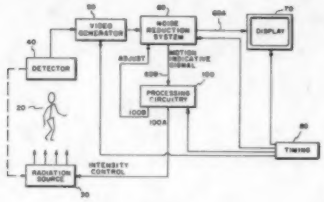
VIDEO IMAGING WITH AUTOMATICALLY CONTROLLED RADIATION SOURCE

Renville H. McMann, Jr., New Canaan, Conn.; Stephen Kreinik, Monsey, N.Y., and Martin M. Novack, Weston, Conn., assignors to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Dec. 29, 1980, Ser. No. 220,793

Int. Cl.³ H04N *5/32*

U.S. Cl. 358—111 **27 Claims**



1. Apparatus for imaging a body, comprising:

an adjustable source of radiation directable at the body;

means for detecting radiation received from said body;

means for converting the detected radiation into an electronic video signal;

motion detection means responsive to said video signal for generating a motion-indicative signal as a function of differences between present and past signal levels at elemental positions of the video frame;

control signal generating means responsive to said motion-indicative signal for generating an intensity control signal as a function of said motion-indicative signal;

means for applying said control signal to said source of radiation to vary the active intensity of said source of radiation; and

means for displaying said video signal.

4,409,616

DIGITAL DENTAL SYSTEM AND METHOD

Robert S. Ledley, Silver Spring, Md., assignor to Georgetown University, Washington, D.C.

Filed Mar. 20, 1981, Ser. No. 245,997

Int. Cl.³ H04N *7/18, 5/32*

U.S. Cl. 358—111 **8 Claims**

1. A digital dental system for real time display of a patient's dental image to detect changes with respect to at least one previous dental image of the patient, comprising:

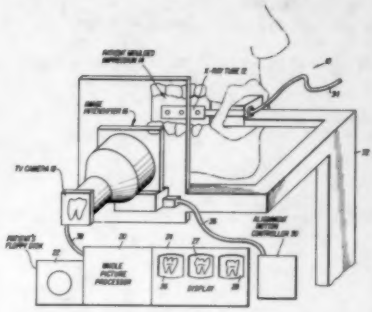
imaging means for obtaining a dental image from the patient in real time and providing said dental image as electrical signals;

converting means for converting said electrical signals to digital signals;

input means for inputting further digital signals corresponding to said at least one previous dental image of the patient;

processing means for processing said digital signals and said further digital signals to develop corresponding display signals and further display signals; and

display means comprising a display unit and at least one further display unit responsive to said display signals and said further display signals, respectively, for simultaneously and in real time displaying said dental image and said at least one previous dental image, respectively of said patient wherein said processing means comprises a plurality of memories, one for each said display unit and said at least one further display unit, and a video crossbar switch connecting said converting means to said plurality of memories, said plurality of memories storing said digital signals and said further digital signals, respectively, said processing means further comprises a video processor connected to said video crossbar switch, said video crossbar switch being actuable for routing digital signals from said plurality of memories to said video processor, said video processor operating to whole picture process said digital signals to determine changes in the patient's dental image with respect to the at least one previous dental image of the patient.



4,409,617

INFORMATION PROCESSING

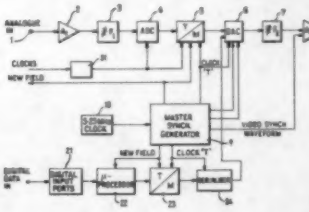
Norman P. Whitehead, Newbury; Kenneth D. Boness, Wallingford, and Roger Martin, Faringdon, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 30, 1981, Ser. No. 326,164

Claims priority, application United Kingdom, Dec. 3, 1980, 8038807

Int. Cl.³ H04N *7/08*

U.S. Cl. 358—147 **13 Claims**



1. An information processor for rendering input data compatible with standard video recording and/or display equipment, said information processor comprising means for digitizing the input data over periods which are synchronous with the fields of a standard video signal, memory means for storing the digitized data and for releasing stored digitized data in correspondence with the line scan of a standard video monitor, said memory means having two halves which correspond to the interlaced fields of a standard video signal and being so arranged that one half is filled while the other is emptied, and means for converting the released stored digitized data into video luminance signals.

4,409,618

DIGITAL VIDEO EFFECTS SYSTEM EMPLOYING A CHROMA-KEY TRACKING TECHNIQUE

Masao Inaba, and Kazuo Kashigi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

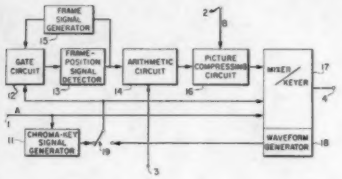
Continuation of Ser. No. 87,334, Oct. 23, 1979, abandoned, which is a division of Ser. No. 922,634, Jul. 7, 1978, Pat. No. 4,200,890. This application Sep. 10, 1981, Ser. No. 301,037

Claims priority, application Japan, Jul. 11, 1977, 52-83285; Jul. 11, 1977, 52-83286

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.³ H04N *5/22, 9/535*

U.S. Cl. 358—183 **3 Claims**



1. A tracking system for producing special effects on a television picture, said television picture comprised of a first picture and a second picture inserted into said first picture, said first and second pictures being represented by first and second video signals respectively, said system comprising:

means for producing a key signal representing a key frame to be positioned on said first picture; means for removing electrical noise signals from said key signal to produce a noise-removed key signal; means responsive to said noise-removed key signal for producing a position signal representing a position of a circumscribed frame of said key frame, said position signal including two horizontal position signal values and two vertical position signal values; means for producing a compressed second video signal representing a compressed second picture in response to said second video signal and said position signal; means responsive to said two horizontal position signal values and two vertical position signal values for producing a frame signal, said frame signal being applied to said removing means; and means responsive to said key signal for selectively combining said first video signal and said compressed second video signal, whereby said special effects are produced.

4,409,619

TELEVISION CAMERA WITH AN ELECTRONIC VIEW FINDER

Takayuki Takubo, and Takeshi Okano, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 30, 1981, Ser. No. 259,458

Claims priority, application Japan, Apr. 30, 1980, 55-59516[U]

Int. Cl.³ H04N *5/26*

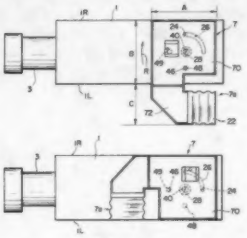
U.S. Cl. 358—224 **14 Claims**

1. A television camera assembly comprising:

(a) a television camera body having a top and two sides which are substantially parallel to a camera axis passing through a lens attached to said television camera body and a subject to be viewed by said television camera;

(b) an electronic view finder having a body mounted on or above the top of said television camera body, an eyepiece portion attached to one side of a body of said electronic view finder; and

(c) means for pivotally mounting said body of said electronic view finder on or above the top of said television camera body so that said electronic view finder can be rotated between a position of use and a position of non-use through substantially 90 degrees in a plane parallel to the camera axis and perpendicular to said two sides of said television camera body, the electronic view finder including the eyepiece portion having a length less than its width in the direction of the camera axis, when in said position of use, said eyepiece portion projecting from one side of said television camera body when said electronic view finder body is rotated to said position of use whereby a user can readily look into said eyepiece portion when using said



television camera assembly, and said eyepiece portion being positioned above and substantially contiguous with said television camera body when said electronic view finder body is rotated to the position of non-use whereby said eyepiece portion does not project substantially beyond the sides of said television camera body when viewed from the top, thereby reducing the effective width of said television camera assembly when altering it to the position of non-use.

4,409,620

PICTURE DIVISION TYPE AUTOMATIC EXPOSURE CONTROL DEVICE FOR TELEVISION CAMERA

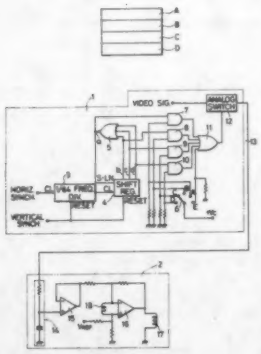
Shigeo Enomoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1981, Ser. No. 284,745

Claims priority, application Japan, Aug. 26, 1980, 55-117348

Int. Cl.³ H04N *5/38*

U.S. Cl. 358—228 **12 Claims**



1. An automatic exposure control circuit for a television camera, comprising:

a video signal extracting circuit means for dividing a video signal for a field into a plurality of parts in a time division mode and for selectively extracting any one of said parts each of which represents a different specified picture region less than the entire field; and

means for performing automatic exposure control in re-

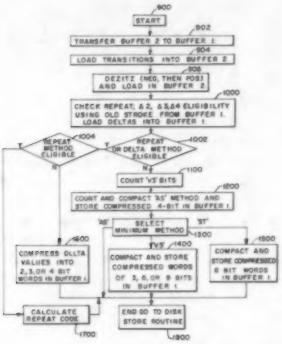
sponse to a video signal corresponding only to said picture region extracted by said video signal extracting circuit means.

4,409,621

METHOD AND APPARATUS FOR COMPACTING AND DECOMPACTING CHARACTER IN ACCORDANCE WITH A VARIETY OF METHODS

John S. Richards, and Alan G. DePaoli, both of Bolingbrook, Ill., assignors to Information International, Inc., Culver City, Calif.

Division of Ser. No. 908,772, May 23, 1978. This application Jun. 25, 1979, Ser. No. 51,945
Int. Cl.³ H04N 7/12
U.S. Cl. 358—260 32 Claims


START
TRANSFER BUFFER 2 TO BUFFER 1
LOAD TRANSITIONS INTO BUFFER 2
DEZITZ (NEG. THEN POS.) AND LOAD IN BUFFER 2
CHECK REPEAT, Δ2, Δ3,4 ELIGIBILITY USING OLD STROKE FROM BUFFER 1. LOAD DELTAS INTO BUFFER 1
REPEAT METHOD ELIGIBLE
REPEAT OR DELTA METHOD ELIGIBLE
COUNT 'N' BITS
COUNT AND COMPACT 'N' METHOD AND STORE COMPRESSED 'N'-BIT IN BUFFER 1
SELECT MINIMUM METHOD
COMPRESS DELTA VALUES INTO 2,3,OR 4 BIT WORDS IN BUFFER 1
COMPACT AND STORE COMPRESSED WORDS OF 3, 6, OR 9 BITS IN BUFFER 1
COMPACT AND STORE COMPRESSED 8 BIT WORDS IN BUFFER 1
CALCULATE REPEAT CODE
END GO TO DISK STORE ROUTINE

1. An apparatus for providing a coded representation of a character comprising a plurality of substantially linear, adjacent zones, selected of said zones comprising one or more segments, each segment having a transition at each end thereof, the combination of:

(a) means for providing signals indicative of the orthogonal positions of said transitions;

(b) means for storing separately the transition signals of a first zone from the transition signals of a second zone adjacent to said first zone;

(c) means coupled to said storing means for counting the transition signals of said first and second zones to provide first and second counts respectively, for comparing said first count of the number of transition signals in said first zone with respect to said second count of the number of transition signals in said second zone, and for selecting one of a plurality of methods of encoding which provides the smallest quantity of storable data indicative of the transitions of each of said zones dependent upon said comparison; and

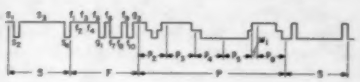
(d) means for encoding the transition signals of each of said zones into encoded data in accordance with the encoding method selected for said zone; said means for counting, comparing and selecting including means responsive to the first and second counts of transition signals in said first and second zones being unequal for examining the number and spacing of said transitions within a zone to select a first encoding method if there are a relatively small number of transitions within a single zone, to select a second encoding method if there are a large number of transitions within a single zone, and to select a third encoding method if there is a larger number of transitions than that required to initiate said second encoding method.

4,409,622

METHOD OF SKIPPING ALL-WHITE BLOCKS BY INTERPOSING A WHITE SIGNAL PIECE BETWEEN TWO ADJACENT BLOCKS WHICH ARE NOT CONSECUTIVE IN AN ORIGINAL FACSIMILE SIGNAL

Hideaki Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 318,950
Claims priority, application Japan, Nov. 11, 1980, 55-158710
Int. Cl.³ H04N 1/40, 7/12
U.S. Cl. 358—260 5 Claims



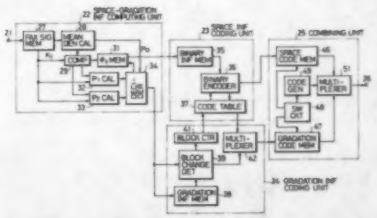
1. A method of compressing graphic information of an original facsimile signal comprising black and white signal elements representative, respectively, of black and white areas arranged along a line of scan on an original text, said method including the steps of dividing said original facsimile signal into a plurality of signal blocks corresponding to graphic blocks on said original text and having predetermined durations, respectively, of producing control flags for the respective signal blocks for use in discriminating a signal block consisting of a white signal element from a signal block comprising a signal element other than the white signal element, and of producing a compressed facsimile signal comprising said control flags and a succession of the signal blocks comprising the signal elements other than the white signal element with the signal blocks consisting of white signal elements deleted from said succession, wherein the improvement comprises the step of interposing a white signal piece of a preselected duration between two adjacent signal blocks in said succession only when said two adjacent signal blocks do not correspond to the graphic blocks which are continuous on said original text.

4,409,623

METHOD AND EQUIPMENT FOR PROCESSING GRAY SCALE FACSIMILE SIGNAL

Makoto Kobayashi, Yokosuka; Tetsuji Yamamoto, and Yoshihiro Jimbo, both of Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,548
Claims priority, application Japan, Jan. 31, 1981, 56-12233; Jan. 31, 1981, 56-12234; Apr. 20, 1981, 56-59505
Int. Cl.³ H04N 7/12
U.S. Cl. 358—261 14 Claims



1. A method for processing a gray scale facsimile signal, comprising the steps of:

dividing the gray scale facsimile signal into a plurality of block signals, each block signal being a facsimile signal containing a gray scale component which corresponds to one of the blocks obtained by dividing an original picture of the facsim-

ile signal into a plurality of blocks, each composed of a plurality of picture elements;

classifying picture element signals of each block signal into a high optical density and a low optical density group through the use of a threshold value and generating binary space information indicating which one of the two groups each picture element signal belongs to;

obtaining means gradation information of the high optical density group and mean gradation information of the low optical density group for each block signal and making the gradation of each block signal to be represented by the two pieces of gradation information;

making the gradation information of the block signal to be represented by one of the two pieces of gradation information in the case where the difference between the two pieces of gradation information of the block signal is smaller than a predetermined value and/or in the case where the number of picture element signals belonging to either one of the two groups is smaller than a predetermined value;

correcting the space information to space information having all the picture elements of the block signal belonging to one of the two groups in the case of the gradation information of the block signal being represented by one of the two pieces of gradation information;

coding the space information into a binary code corresponding to the order of occurrence of the picture element signals of the facsimile signal to obtain space coded data; and

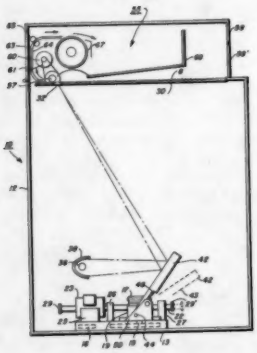
combining the space coded data and the representative gradation information into a series of coded data for output.

4,409,624

RASTER SCANNING APPARATUS

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1982, Ser. No. 364,132
Int. Cl.³ H04N *1/04*; G03G *15/28*
U.S. Cl. 358—285 **12 Claims**



10. A raster input scanner comprising:

(a) a transparent platen for supporting documents to be scanned;

(b) lamp means movable across the length of said platen to progressively illuminate the document thereon during scanning;

(c) lamp drive means for moving said lamp means;

(d) a linear scanning array, said array being stationary;

(e) a lens interposed between said platen and said array for focusing image lines from said document onto said array; and

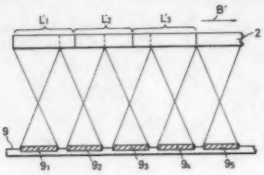
(f) drive means for moving said lens in synchronism with said lamp means at a fraction of the rate at which said lamp means is moved, the fractional rate at which said lens is moved being proportional to the reduction ratio between said platen and said array.

4,409,625

METHOD AND APPARATUS FOR INFORMATION READING IN ORIGINAL DOCUMENT READERS

Satoru Ogasawara, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1982, Ser. No. 337,892
Claims priority, application Japan, Jan. 7, 1981, 56-972
Int. Cl.³ H04N *1/17*
U.S. Cl. 358—288 **10 Claims**



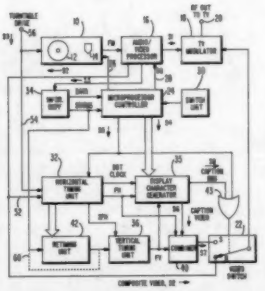
1. An information reading device comprising a sensor having a plurality of sensing elements receiving an image of an original document through an optical system, said original document having respective lines of information thereon separated by first intervals, said sensing elements not aligned with said lines of information separated by said first intervals such that the lines of information in the image received by said sensing elements are not aligned with said sensing elements, and logic means for combining selected sensor element outputs to obtain signals representing information on respective lines.

4,409,626

VIDEO DISC PLAYER HAVING VERTICAL TIMING SIGNAL GENERATOR

James M. Ferguson, Levittown, Pa.; Thomas Y. Chen, Brunswick, and Walter G. Gibson, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 6, 1981, Ser. No. 309,193
Int. Cl.³ H04N *5/76, 5/04*
U.S. Cl. 358—338 **10 Claims**



1. A video disc player, comprising:

signal recovery means for providing a composite video output signal having recurring horizontal timing components and recurring vertical timing components and in which a data word is present during a horizontal line of the vertical interval thereof;

first means coupled to said recovery means for processing

said data words to provide a data status signal indicative of the validity of each processed data word;

second means coupled to said recovery means for providing a reference signal having a frequency proportional to the horizontal line rate of said composite video output signal;

third means responsive to said reference signal for continuously producing a vertical timing signal having a frequency proportional to the field rate of said composite video output signal;

fourth means for applying said data status signal to said third means for causing said vertical timing signal produced by said third means to exhibit a predetermined timing relationship with said vertical timing component of said composite video output signal; and

fifth means for utilizing said vertical timing signal.

4,409,627

VIDEO SIGNAL DECODING CIRCUIT

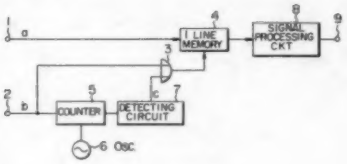
Yoshizumi Eto, Sagamihara, and Yasuhiro Hirano, Hachioji, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1980, Ser. No. 184,313

Claims priority, application Japan, Sep. 10, 1979, 54-115282

Int. Cl.³ H04N *5/94*

U.S. Cl. 360—38.1 **6 Claims**



1. A video signal decoding circuit for decoding a received video code signal which is accompanied by a clock signal comprised of pulses synchronized with the video code signal comprising:

memory means for storing said video code signal in synchronism with said clock signal;

signal processing means coupled to said memory means for decoding the data stored in said memory means;

first means for detecting a drop-out of pulses in only said clock signal; and

second means coupled to said memory means for producing a quasi-code in that portion of the video code signal which occurs only when a drop-out of said clock signal is detected by said first means.

4,409,628

TAPE TRANSPORT SPEED CONTROL USING A PLAYBACK DATA DERIVED CLOCK SIGNAL

Stanley H. Frimet, Englewood, and Leighton A. Meeks, Littleton, both of Colo., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 16, 1981, Ser. No. 321,365

Int. Cl.³ G11B *15/52*

U.S. Cl. 360—73 **14 Claims**

1. A tape transport speed control system comprising:

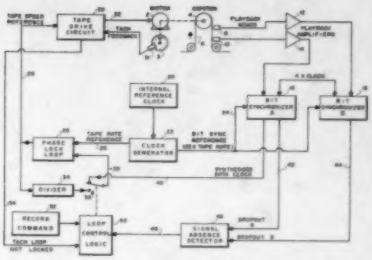
playback means for reading digital data signals recorded on a preselected recording track of a recording medium,

means for driving the recording medium past said playback means;

means for synthesizing digital clock signals representative of the speed of the recording medium during the recording of the digital data signals from said digital data signals;

means for producing a digital signal representative of the speed of the recording medium during the playback of said digital data signals, and

speed control means responsive said digital signal from said means for producing and said digital clock signal from said means for synthesizing to produce a control signal for



said means for driving to maintain the speed of the recording medium at the speed used during the recording of said digital data signals.

4,409,629

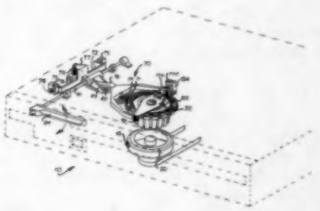
MECHANISM FOR CENTERING AND CLAMPING A FLOPPY DISC

Norman M. Puls, Woodland Hills, Calif., assignor to Magnum Division of Tandon Corporation, Chatsworth, Calif.

Filed May 4, 1981, Ser. No. 259,913

Int. Cl.³ G11B *5/016, 17/02, 25/04*

U.S. Cl. 360—99 **10 Claims**



1. A positioner system for floppy disc drives having a rotatable center spindle comprising:

a positioner element comprising a multiple-petal cone insertable within the central aperture of a floppy disc, a portion of the outer cone surface defined by the petals being greater in diameter than the nominal dimension of the interior aperture of the floppy disc, the petals being sufficiently compliant to be bent inwardly by the floppy disc edge upon insertion without distorting the floppy disc and to thereafter restore the unclamped disc to concentricity; and

follower means mounted adjacent the positioner element and movable to engage the petals thereof to urge the petals downwardly to clamp the floppy disc against the spindle.

4,409,630

INFORMATION SIGNAL RECORDING AND/OR REPRODUCING APPARATUS AND A RECORDING JACKET FOR USE THEREWITH

Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1980, Ser. No. 214,737

Claims priority, application Japan, Dec. 29, 1979, 54-171747

Int. Cl.³ G11B *5/016, 21/08, 5/82, 23/02*

U.S. Cl. 360—99 **31 Claims**

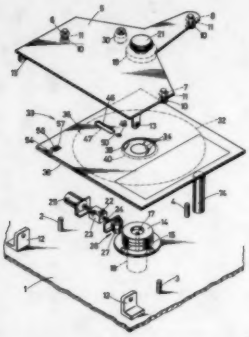
1. A jacket for positioning a recording sheet in an informa-

tion signal recording and/or reproducing apparatus of the type including holding means, comprising:

an upper plate having a peripheral portion;

a lower plate having a peripheral portion and cooperating with said upper plate for sandwiching said recording sheet between said upper plate and said lower plate;

a peripheral wall enclosing the peripheral portions of the upper and lower plates; and



positioning means located on at least one of said upper and lower plates and adapted to cooperate with said holding means so that said holding means pulls at least said one of said upper plate and said lower plate in a direction away from the other for maintaining said upper plate and said lower plate a substantially fixed distance apart during operation of said apparatus with said jacket and recording sheet positioned therein.

4,409,631

OPTICAL APPARATUS AND METHOD FOR REPRODUCING INFORMATION RECORDED IN A MAGNETIC RECORDING MEDIUM

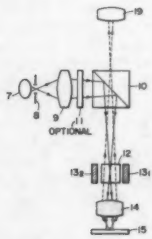
Kazuya Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,536

Claims priority, application Japan, Dec. 27, 1980, 55-188878

Int. Cl.³ G11B *5/32*

U.S. Cl. 360—114 **5 Claims**



1. An optical apparatus to reproduce information recorded in a magnetic recording medium by utilization of the interaction between light and magnetism, which comprises:

(a) a light source to supply a light beam for reproduction;

(b) a polarizing beam splitter, the transmission and reflection factors of which depend on the polarization direction of the light beam, and which leads said light beam for reproduction from said light source to the magnetic recording medium, and, in interaction with the magnetism in said magnetic recording medium, receives again said emitting light beam for reproduction to lead it to a direction different from the direction of said light source; and

(c) rotatory polarizing means disposed in a light path of said light beam for reproduction between said polarizing beam splitter and said magnetic recording medium, and to rotate the polarized plane of said light beam for reproduction.

4,409,632

MAGNETIC HEAD ARRANGEMENT

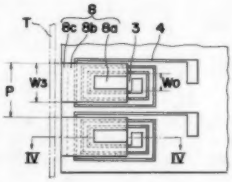
Kenji Kanai, Neyagawa; Nobuyuki Kaminaka, Moriguchi; Norimoto Nouchi, Katano, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 19, 1980, Ser. No. 208,480

Claims priority, application Japan, Nov. 20, 1979, 54-151047

Int. Cl.³ G11B *5/20, 5/22*

U.S. Cl. 360—123 **7 Claims**



1. A magnetic head arrangement including a plurality of magnetic head units aligned with a predetermined pitch along a first direction orthogonal to a second direction of movement of a recording medium, each said magnetic head unit comprising:

a first magnetic layer;

a first electrically insulating layer in contact with said first magnetic layer;

an electrically conductive layer formed directly on said first electrically insulating layer, said electrically conductive layer being in the shape of a spiral having a central opening;

a second electrically insulating layer covering a portion of said spiral which is wider than said central opening;

a second magnetic layer having a contacting portion within said central opening and in magnetic connection with said first magnetic layer, an intermediate portion located above said portion of said spiral and electrically insulated therefrom by said second electrically insulating layer, and a gap forming portion positioned exteriorly of said spiral and forming with said first magnetic layer a predetermined gap adapted to confront a recording medium;

said second magnetic layer including said gap forming portion having a width in said first direction greater than the width in said first direction of said central opening; and

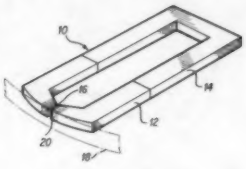
the total length of a border between said contacting portion and said intermediate portion being equal to or greater than the width in said first direction of said gap forming portion.

4,409,633

MN-ZN SINGLE CRYSTALLINE FERRITE HEAD AND A METHOD OF MAKING THE SAME

Hisashi Watanabe, Yokohama; Yoshiteru Urino, Tokyo, and Shinichi Aotsu, Urawa, all of Japan, assignors to Akai Electric Company Limited, Tokyo, Japan

Division of Ser. No. 18,768, Mar. 8, 1979, Pat. No. 4,285,894. This application Apr. 3, 1981, Ser. No. 250,557
Claims priority, application Japan, Mar. 13, 1978, 53-28873
Int. Cl.[3] G11B *5/14, 5/22*
U.S. Cl. 360—127 3 Claims



1. A magnetic head, for a magnetic tape recording and reproducing apparatus, comprising:

at least one head core, at least a part of which is made of Mn-Zn single crystalline ferrites where an air gap is formed;

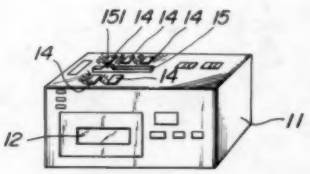
wherein different phases are locally precipitated only at a region including the air gap at the central portion thereof where a running magnetic tape is contacted during the recording and reproducing operations of the tape recording and reproducing apparatus.

4,409,634

TAPE RECORDER

Ryoichi Sawaki, and Toshihiko Kadota, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed May 8, 1981, Ser. No. 261,754
Claims priority, application Japan, May 12, 1980, 55-64631[U]
Int. Cl.[3] G11B *15/04*
U.S. Cl. 360—137 1 Claim



1. An audio tape mechanism comprising:

a casing;

a cassette tape chamber for receiving a tape cassette therein;

speaker means for generating sound developed from operative engagement of a tape cassette placed within said tape chamber with said audio tape mechanism;

control means within said audio tape mechanism for controlling operation of said tape cassette to enable said audio tape mechanism to both record sound on said tape cassette and to reproduce recorded sound through said speaker means;

a plurality of operating buttons located on the exterior of said casing for enabling selective actuation of said control means for effecting controlled actuation of said audio tape mechanism, said operating buttons including a record button capable of effecting operation of said audio tape mechanism to record sound on said tape cassette while simultaneously erasing any sound previously recorded thereon; and

tactile indicating means arranged on said casing adjacent said buttons to enable said buttons to be distinguished one from the other by human touch alone, said tactile indicating means including means for enabling said record button to be readily distinguished from the others of said plurality of buttons;

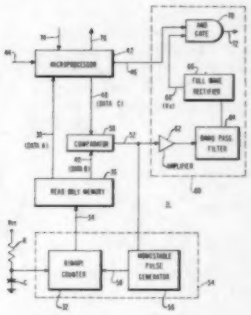
said tactile indicating means comprising a projected wall arranged to project from the surface of said casing, said projected wall being formed with a portion extending about said record button on at least three sides thereof.

4,409,635

ELECTRICAL POWER SYSTEM WITH FAULT TOLERANT CONTROL UNIT

Mark G. Kraus, Churchill Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 18, 1981, Ser. No. 275,425
Int. Cl.[3] H02H *7/26*
U.S. Cl. 361—62 16 Claims



1. An electrical power system comprising:

a plurality of generators;

a plurality of contactors individually connected in series with the output of said generators and a plurality of power buses;

computer means having input means for receiving information signals and output means for delivering digitally encoded information signals;

said computer means being adapted to treat said received information signals in accordance with a predetermined program and to produce said digitally encoded output information signals;

said computer means being further adapted to run through a self-test program and to generate a digital control word at the end of each test program sequence after a fixed time interval following the initiation of said self-test program, wherein said control word encodes the test program results;

a memory for storing predetermined digitally encoded messages and self-test routine instructions in a given sequence and outputting said messages and said self-test routine instructions;

a comparator for comparing said predetermined digitally encoded messages from said memory means and said digitally encoded control words from said computer means, producing an output signal at a first logic level when said messages are equivalent to said control words and producing an output signal at a second logic level when said messages are not equivalent to said control words;

means for initializing said memory such that a selected predetermined digitally encoded message appears at the out-

put of said memory when electrical power is applied to the control unit;

feedback means responsive to a transition in said comparator means output signal which delivers signals to said memory means for the purpose of indexing said predetermined digitally encoded messages and self-test routine instructions after said fixed time interval following the occurrence of said transition; and

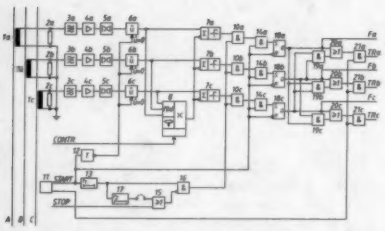
output means responsive to said comparator means for controlling said contactors in accordance with said computer means output information signals when the comparator means output signal periodically switches between said first and second logic levels to define a square wave, and for driving said contactors into a predetermined state when the comparator means output signal fails to define a square wave.

4,409,636

DEVICE FOR DETECTING FAULTY PHASES IN A MULTI-PHASE ELECTRICAL NETWORK

Nils Brandt, and Torbjörn Einarsson, both of Västeras, Sweden, assignors to Asea Aktiebolag, Västeras, Sweden

Filed Dec. 4, 1981, Ser. No. 327,454
Claims priority, application Sweden, Dec. 5, 1980, 8008576
Int. Cl.³ H02H *3/26*
U.S. Cl. 361—87 **13 Claims**



1. A device for detecting at least one faulty phase in a multiphase electrical network comprising,

a band exclusion filter connected to each phase of the network for filtering off the part of a received signal which has the same frequency as the nominal operating frequency of the network, said signal being proportional to the current which flows through the phase,

a first output for each phase for indicating whether or not there is a fault in that phase,

a second output of the device for each phase for a tripping signal for supply to a circuit breaker in that phase,

a rectifying unit,

a unit for determining the peak value of the output from the rectifier unit, both said rectifying unit and said peak value determining unit being connected to each said band exclusion filter,

a function element to receive the output signals from the peak value forming units in all the phases and to produce an output signal which represents a percentage of the phase signal whose amplitude is highest,

a level and comparison device for each phase, in which the output signal from the function element is compared with the rectified peak value for each phase, and

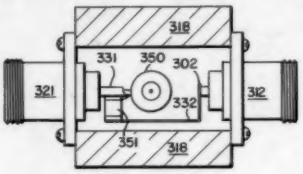
means to control the generation of signals for said first and second outputs of the device from the output signal from the respective level and comparison device.

4,409,637

CONNECTOR FOR ELECTROMAGNETIC IMPULSE SUPPRESSION

Roger R. Block, 4712 S. Wind Blvd., Kissimmee, Fla. 32741

Continuation-in-part of Ser. No. 138,354, Apr. 8, 1980, Pat. No. 4,359,764. This application Nov. 15, 1982, Ser. No. 441,765
Int. Cl.³ H02H *3/22*
U.S. Cl. 361—119 **14 Claims**



1. An electrical impulse suppressor for shunting electromagnetic impulse energy along a radio frequency signal transmission line of the type having primary and secondary conductors and a known characteristic impedance therebetween, the suppressor comprising in combination:

paired first and second electrical connectors each having primary and secondary conductors for being operatively interposed along the primary and secondary conductors of the radio frequency signal transmission line;

first and second discharge means each for defining a known breakdown voltage and a known capacitance between first and second sections thereof;

first means for electrically coupling said first section of said first discharge means between said primary conductors of said first and second electrical connectors;

second means for electrically coupling said first section of said second discharge means between said secondary conductors of said first and second electrical connectors; and

groundplane means located adjacent said first means and said second means for electrically coupling said second section of each of said discharge means to a ground potential, with said first means and said second means and groundplane means having known inductances which interact with said capacitances of each of said discharge means and any stray capacitance of the combination thereof to produce a characteristic impedance which is generally equal to the characteristic impedance of the radio frequency signal cable, whereby the suppressor will shunt electrical impulse energy to ground potential while normally representing a low standing wave ratio for radio frequency energy transmitted along the transmission line.

4,409,638

INTEGRATED LATCHING ACTUATORS

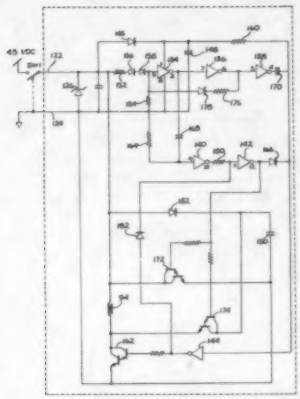
Oded E. Sturman, c/o Kineret Engineering, 9819 Etiwanda Ave.; Benjamin Grill, 9819 Etiwanda Ave., both of Northridge, Calif. 91325, and Lynn Harrison, 23554 Cherry St., Newhall, Calif. 91321

Filed Oct. 14, 1981, Ser. No. 311,174
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—152 **11 Claims**

1. An integrated latching actuator comprising an actuator having a stationary magnetic member, at least one coil, a moveable magnetic member and a return means, said stationary magnetic and said moveable magnetic member forming a magnetic circuit, said moveable magnetic member being moveable with respect to said stationary magnetic member between a first latched position and a second unlatched position, said at least one coil being disposed in said magnetic circuit so that a first current pulse therein magnetizes said magnetic circuit and encourages said moveable magnetic member to said first posi-

tion wherein the retentivity of said magnetic circuit will maintain said moveable magnetic member at said first position, and a second current pulse therein substantially demagnetizes said magnetic circuit, said return means being a means for encouraging said moveable magnetic member to said second position upon substantial demagnitization of said magnetic circuit

circuit means having first and second electrical connections and being coupled to said at least one coil, said circuit means being a means responsive to a first predetermined voltage sequence applied to said electrical connections to provide said first current pulse to said at least one coil, and



responsive to a second predetermined voltage sequence applied to said electrical input connections to provide said second current pulse to said at least one coil, wherein said first predetermined voltage sequence is the application of a substantially nonzero voltage, the removal of said substantially nonzero voltage for a period less than a predetermined time period, followed by the reapplication of the substantially nonzero voltage

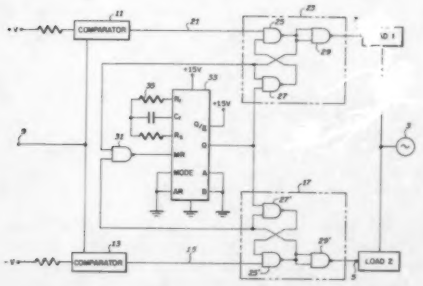
enclosure means containing said actuator and said circuit means, said first and second electrical input connections being accessible outside said enclosure means.

4,409,639

SOLENOID DRIVER CIRCUIT

Charles R. Wesner, Crozet, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,445
Int. Cl.³ H01H *47/18*
U.S. Cl. 361—167 **4 Claims**



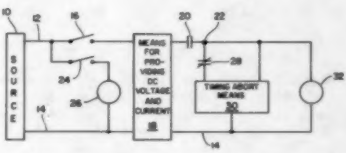
1. A driver circuit for energizing a solenoid in response to analog input signals, said circuit comprising input terminal means for receiving said analog input signals, comparator means coupled to said input terminal means for producing a high constant value control signal whenever the input signal exceeds a predetermined threshold value, output terminal means for coupling the control signal to a load, gating circuit means for coupling said control signals to said output terminal means, and timing means for disabling said gating circuit means for a predetermined time interval after the termination of a high level control signal, said gating circuit means including signal gating means through which the control signal is coupled to the output terminal means, and enabling gating means for enabling and disabling said signal gating means in response to the output of said timing means.

4,409,640

ABORT CYCLE TIMER

Mark V. Profio, Wauwatosa; James T. Libert, Waukesha, and Julian C. Kampf, Grafton, all of Wis., assignors to Square D Company, Palatine, Ill.

Filed Nov. 9, 1981, Ser. No. 319,487
Int. Cl.³ H01H *47/18*
U.S. Cl. 361—197 **14 Claims**



1. An abort cycle timer circuit connected to an AC source of electrical power having first and second conductors and providing an AC electrical signal and for operating electrical equipment, said circuit comprising:

a means for providing a substantially DC voltage and current;

a first relay having at least one set of normally open contacts and at least one set of normally closed contacts, said normally open contacts connected between said means for providing a DC voltage and current and a junction point, and one of said normally closed contacts connected to said junction point;

a first means for causing an open circuit connected in series between the first conductor and said means for providing a DC voltage and current;

a second means for causing an open circuit connected in series with a coil of said first relay between the first conductor and the second conductor; and,

a timing abort means for operating a coil of a second relay and connected to said normally closed contacts of said first relay, said junction point and the second conductor, said coil of said second relay connected between said junction point and the second conductor, said second relay having normally open and/or normally closed contacts.

4,409,641

ENVIRONMENTALLY PROTECTED ELECTRONIC NETWORK STRUCTURE AND HOUSING COMBINATION

Gert Jakob, Stuttgart; Willi Gansert, Kornwestheim; Siegfried Goetzke, Bietigheim-Bissingen, and Lothar Ruttkowski, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 262,914
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1980, 3020902
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **15 Claims**

1. Environmentally protected electronic network structure,

particularly a control system for automotive vehicles, including a printed circuit board (41) and electrical and electronic circuit elements (42, 43, 65), at least some of which (43, 65) require cooling, having

a housing (1) retaining said printed circuit board;

a cover (49) closing off the housing,

the electrical and electronic circuit elements being supported on the printed circuit board;

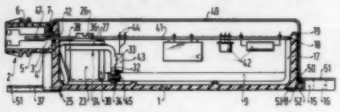
a heat conducting element (24, 25; 73, 75) located in thermal transfer relation with respect to said at least some circuit elements requiring cooling to conduct heat therefrom;

and an externally accessible multi-terminal connection socket (2) to provide externally accessible electrical terminals,

wherein

the housing comprises a unitary pan or tub-shaped element (1) of an electrically insulating plastic material;

said printed circuit board (41) having a unitary projecting portion forming a projecting contact terminal strip (47);



said housing being formed with a slit (3) through which said projecting terminal portion extends, and further being formed with a plug receiving portion externally of the slit and adjacent the projecting portion (47) of the printed circuit board, with clearance, to permit engagement with a plug connector for the terminals of the terminal strip on the printed circuit board;

said unitary plastic element being further formed with internal locating means for positioning and holding the printed circuit board (41) therein;

being additionally formed with an internal attachment means (23, 62, 69) for attachment, in heat transfer relation, of said heat conducting element (24, 25; 73, 75);

and being additionally formed with external attachment means (13, 15) for attachment of the housing to a support structure on the vehicle;

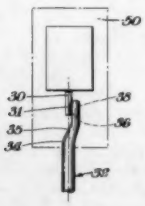
and wherein said cover (49) comprises a metal lid secured to said housing element (1) and closing off the pan or tub-shaped element, while providing for radiation of heat generated by the electrical and electronic elements positioned within the housing.

4,409,642

OFFSET LEAD CONFIGURATION FOR SOLID ELECTROLYTE CAPACITOR

Douglas M. Edson, Alfred, Me., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 24, 1980, Ser. No. 209,818
Int. Cl.³ H01G 9/00; B01J 17/00
U.S. Cl. 361—433 6 Claims



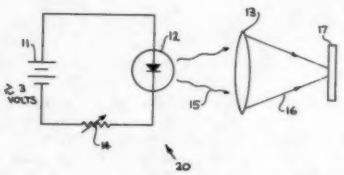
1. A solid electrolyte capacitor comprising a capacitor body having a conductive cathode coating, a riser extending from said body and isolated from said coating, a cathode lead wire in contact with said coating, an anode lead wire in contact with said riser, and a molded encapsulating material surrounding and enclosing said body, said riser, and portions of said lead wires to form a case, said anode lead wire having three spaced apart elbows forming an offset bent transverse portion and a non-offset portion; said riser and said non-offset portion of said anode lead wire being coaxial with each other; two of said elbows offsetting said bent portion a spaced distance from said riser and said non-offset portion, the third of said elbows forming said bent transverse portion, said contact of riser to anode lead wire being at said bent transverse portion, and said transverse portion and said offset portion of said lead wire being enclosed in said case.

4,409,643

LONG LIFETIME, LOW INTENSITY LIGHT SOURCE FOR USE IN NIGHTTIME VIEWING OF EQUIPMENT MAPS AND OTHER WRITINGS

Alan M. Frank, Livermore, and William R. Edwards, Modesto, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 23, 1982, Ser. No. 360,966
Int. Cl.³ F21L 7/00
U.S. Cl. 362—157 5 Claims



1. A low intensity, long-lifetime continuous light source for nighttime use for low intensity illumination of maps and documents to enable reading time without obscuring normal night vision, which comprises:

a power source;

a diode, electrically connected in series to said power source, for producing visible wavelength light in response to a small current through said diode from said power source;

a lens positioned adjacent to said diode to focus at least a portion of said diode light, said lens having a focal length in the range of 1 to 2 centimeters; and

means electrically connected in series with said power source and said diode so as to reduce the intensity of the light produced by said diode by controlling the current through said diode.

4,409,644

BATTERY SYSTEM ADAPTER FOR USING FILM POWER PACKS

Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.

Filed Jun. 12, 1981, Ser. No. 272,987
Int. Cl.³ F21L 7/00
U.S. Cl. 362—200 4 Claims

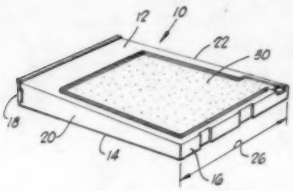
1. A battery assembly for replacing one of a NEDA 908 like battery and a NEDA 26 like battery adapted for using a film power pack as a source of electrical energy, the film power pack having a length, a width, and a height, and at least two film power pack terminals, the battery assembly comprising:

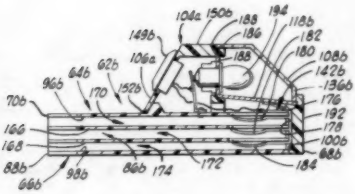
a case having a substantially square cross-section in a hori-

zontal plane and a holding opening extending a distance therethrough and intersecting a portion of the case;

a plurality of dividers disposed in the holding opening and connected to the case, each divider being spaced a distance from at least one adjacent divider to form a holding space between each pair of adjacent dividers and each of the holding spaces being sized and adapted for receiving and retainingly accommodating a substantial portion of one film power pack;

contact means connected to the case and having a portion disposed in the holding opening, the portion of the contact





means disposed in the holding opening being contactable with the film power pack terminals when the film power packs are disposed in the holding spaces, the contact means contacting the film power pack terminals of each film power pack to connect at least some of the film power packs in electrical series, the source of electrical energy provided by the film power pack being provided at the contact means; and

at least two terminals, each terminal connected to the case and to a portion of the contact means, the source of electrical energy provided by the film power pack being provided at the terminals.

4,409,645

COMBINATION FLASHLIGHT AND AUXILIARY POWER PACK

Francis J. Sloan, 211 Holly St., Cranford, N.J. 07016

Filed Oct. 9, 1981, Ser. No. 310,287
Int. Cl.³ F21L 7/00
U.S. Cl. 362—200 **21 Claims**

1. A power pack for accommodating therein at least one battery comprising:

a housing forming a chamber therein;

a carrier for insertion in said chamber;

electrical contact means mounted on said carrier for operably electrically contacting the terminals of said at least one battery; and

electrical connector means mounted on said carrier, said electrical connector means being electrically coupled to said contact means and being accessible from the exterior of said housing when said carrier is disposed in said housing chamber.

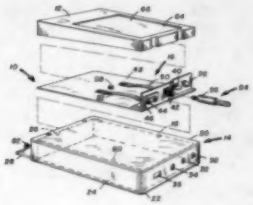
21. A flashlight and auxiliary power pack for utilizing flat batteries disposed in cartridges configured for also accommodating therein a plurality of photographic image rendering units comprising:

a housing forming therein a chamber;

a carrier for insertion in said chamber, said carrier configured to conform substantially to said cartridge;

electrical contact means mounted on said carrier for operably electrically contacting the terminals of said battery when said cartridge is placed in said carrier;

electrical illumination means mounted on said carrier and being selectively electrically coupled to said electrical contact means, said electrical illumination means being



visible from outside said housing when said carrier is inserted therein;

electrical connector means mounted on said carrier, said electrical connector means being selectively electrically coupled to said contact means and being accessible from the exterior of said housing when said carrier is disposed in said housing chamber; and

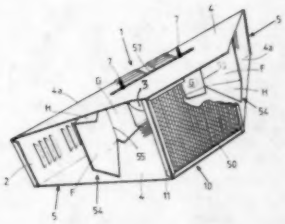
electrical switch means for selectively coupling said electrical illumination means and said electrical connector means to said electrical contact means.

4,409,646

MULTIPLE-EFFECT LIGHT SOURCE, ESPECIALLY USABLE AS A PROJECTOR FOR PHOTOGRAPHY, MOTION PICTURES AND TELEVISION OR AS A LIGHTING APPARATUS

Mardick Baliozian, 15, route de Val Martin, Sainte-Gemme, F-78810 Feucherolles, France

Filed Jan. 13, 1981, Ser. No. 224,798
Claims priority, application France, Sep. 11, 1980, 80 19612
Int. Cl.³ F21V 17/02
U.S. Cl. 362—319 **2 Claims**



1. A device to be used with a light source for use as a projector for lighting subjects in photography, motion pictures, or television, comprising:

a polyhedric housing with a rectangular opaque light-reflecting back,

two opaque light-reflecting longitudinal sides contiguous with the long sides of said back and disposed at an angle to the plane of said back,

a central front rectangular side between opposed edges of said longitudinal sides,

two contiguous inclined front translucent sides each of which

is situated between said central front rectangular side and the corresponding extremity of said reflecting back,

said inclined sides being visible in a direction parallel with the reflecting back,

two reflecting flaps mounted on opposite sides of the light source inside the housing and articulated on the back between the lateral sides, in order to move from one extreme position to the other, namely a first position where they are at an angle with respect to the plane of the back and a second position where they lie against it, means to control these flaps so as to place them and keep them in the selected angular position, and adjustable exterior reflecting flaps articulated on the edges common to the back and the translucent lateral faces.

4,409,647

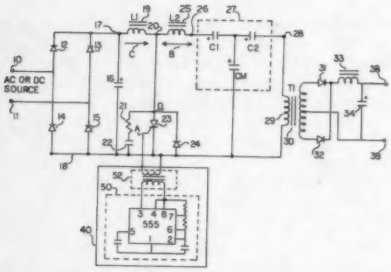
POWER CONVERTER USING A RESONANT CIRCUIT

Harry Terkanian, 267 Concord Ave., Lexington, Mass. 02173

Filed Mar. 12, 1981, Ser. No. 243,125

Int. Cl.³ H02M *3/315, 5/45*

U.S. Cl. 363—27 **8 Claims**



1. A circuit for providing a direct current voltage, said circuit comprising;

A. circuit for rectifying input A C utility voltage to obtain a direct current voltage, ar..d

B. means for capacitive smoothing said direct current voltage, and

C. charging inductance means for coupling said direct current voltage to a resonant circuit

D. said resonant circuit including three capacitive elements, each of said elements connected at a common junction in a so called T connection and having a resonant frequency that will remain in a predetermined and narrow range despite wide variations in loading

E. switch means, consisting of an SCR, an antiparallel diode, and enabling pulse generator, said switch coupled with said charging inductor means and said resonant circuit means for enabling a circulating current representing energy received by means of said charging inductor means, and

F. means, coupled with said resonant circuit means for converting said circulating current to said direct current voltage consisting of an output transformer, rectifier, and filter.

4,409,648

APPARATUS FOR PREVENTING PHASE CONTROL MECHANISM MALFUNCTION

Katsuo Kobari, Tachikawa, and Yoshiaki Hachisuka, Hachioji, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,468

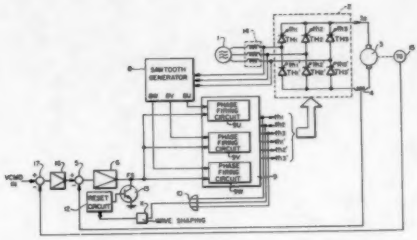
Int. Cl.³ H02H *7/125*

U.S. Cl. 363—54 **7 Claims**

1. An apparatus for preventing malfunctions in a phase control mechanism operatively connectable to receive an analog firing control input signal, and to receive N-number sawtooth signals, said apparatus comprising:

a thyristor bridge, including a plurality of thyristors, operatively connected to receive N-phase power from an N-phase power supply;

a firing angle control circuit operatively connected to said plurality of thyristors, and having an input terminal, for generating thyristor firing pulses to control the firing angle of said plurality of thyristors in response to comparing said analog firing control input signal, arriving at said input terminal of the firing angle control circuit, with each of said N-number of sawtooth signals;



an input signal control circuit, connected to receive the analog firing control input signal received at the input terminal of said firing angle control circuit, for controlling the level of said analog firing control input signal; and

a firing circuit input reset circuit, operatively connected to receive and controlled by said thyristor firing pulses, for enabling said input signal control circuit for at least an interval of time equivalent to the commutation overlap time of said thyristors;

said analog firing control input signal held at a constant level by said input signal control circuit immediately after the generation of each of said thyristor firing pulses.

4,409,649

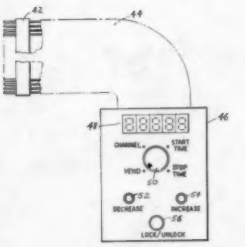
SEQUENCE CONTROLLER WITH MICROPROCESSOR

Stephen E. Heeger, Evansville, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 928,905, Jul. 28, 1978, abandoned. This application Nov. 4, 1980, Ser. No. 203,883

Int. Cl.³ G05B *19/04;* **G06F** *15/46*

U.S. Cl. 364—144 **8 Claims**



1. For use with program controlled apparatus having storage means for storing program data and modifiable storage means for storing data including timing data used by the program controlled apparatus, a service module comprising a hand-held unit, said unit containing display means for displaying said data, and switch means for permanently modifying only said timing data, and an electrical connector connected with said switch means and display means, said connector

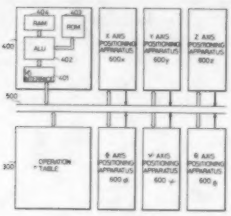
being releasably connectable with said storage means, whereby the data content of said storage means may be displayed by said display means and modified by said switch means only while said service module is connected with said storage means by said connector, said program data other than said time data being unmodifiable by said service module.

4,409,650

AUTOMATIC POSITION CONTROLLING APPARATUS

Fumio Noguchi, Takarazuka, Japan, assignor to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed Mar. 4, 1981, Ser. No. 240,305
Int. Cl.³ G05B *19/42*; G06F *15/46*
U.S. Cl. 364—193 **22 Claims**



1. An automatic position controlling apparatus of a playback system, comprising

means for teaching positional data of a plurality of points,

driving means responsive to said positional data of said plurality of points, as taught, for driving an apparatus to be position controlled,

smoothing means acting on said driving means, said smoothing means including

means for evaluating a formula of a curve smoothly connecting said taught positional data of a plurality of points associated with each other,

means responsive to said curve formula for evaluating a commanded position for every predetermined time interval less than the response time period of said driving means, and

means for correcting said commanded position according to a time delay in the response characteristic of said driving means.

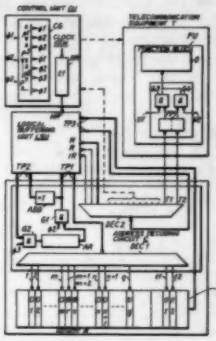
4,409,651

METHOD AND APPARATUS FOR INSERTING INSTRUCTIONS IN A CONTROL SEQUENCE IN A STORED PROGRAM CONTROLLED TELECOMMUNICATIONS SYSTEM

Hans O. S. Kjoller, Västerhaninge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 876,881, Feb. 13, 1978, Pat. No. 4,240,136. This application Feb. 7, 1980, Ser. No. 119,395
Claims priority, application Sweden, Feb. 28, 1977, 7702208
The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **7 Claims**

1. In a stored program controlled equipment having an operating device to be controlled, a clock pulse generator for generating sequences of timing pulses wherein adjacent timing pulses within one of the sequences establishes the clock pulse period of the equipment, an addressed memory means having a plurality of addressed memory element groups for storing control instructions which are read in response to received addresses, an address generator means responsive to said timing pulse for sequentially emitting to the addressed memory means the addresses of the memory element groups to be read, and an instruction decoder means for generating control signals for controlling the operating device, the method of introducing one of a plurality of insertion instructions at one point in the sequence of control instructions, said method comprising the steps of storing in one of the addressed memory element groups the insertion instruction for controlling the testing of the operating device, storing in at least one of the addressed memory element groups an insertion reference instruction routine associated with the fetching of the insertion instruction and the address of the next instruction of the sequence of



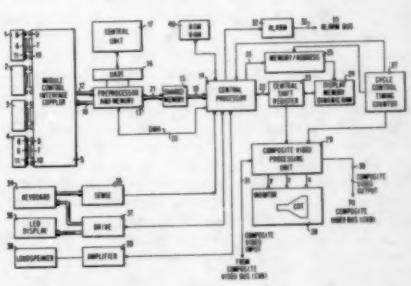
control instructions, upon reading the insertion reference instruction routine momentarily stopping the operation of the address generator means and during such stopping fetching the insertion instruction from the addressed memory means for transfer to the decoder means, then inserting the address of said next instruction of the sequence of control instructions into the address generator means, and then restarting the address generator means.

4,409,652

APPARATUS FOR PROCESSING DIGITAL SIGNALS

Leopold Neumann, Lexington, and Richard B. Kline, II, Stoneham, both of Mass., assignors to Siemens AG, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,764
Int. Cl.³ G06F *15/16, 15/20, 11/00*
U.S. Cl. 364—200 **12 Claims**



1. An apparatus for processing digital signals, containing a microprocessor system, said microprocessor system comprising in combination:

(a) a first processor which is DMA-capable,

(b) a second processor which is not DMA-capable;

(c) a main memory;

(d) first connecting means associated with said first processor for connecting said first processor with said main memory via a first communication path;

(e) second connecting means associated with said second

processor for connecting said second processor with said main memory via a second communication path;

(f) an input for said first processor for receiving an DMA request;

(g) means associated with said second processor for issuing a DMA request at certain time intervals to said input for DMA request of said first processor;

(h) means associated with said first processor for initiating the first processor's current operations such that those operations that the first processor had started before the arrival of the DMA request of said second processor and had not yet completed are now completed; and

(i) means associated with said first processor for producing a signal when the first processor has completed its current operations, said signal controlling said first connecting means associated with said first processor and said second connecting means associated with said second processor to cut off said first communication path between first processor and main memory and instead close the second communication path between said second processor and said main memory.

4,409,653

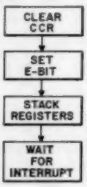
METHOD OF PERFORMING A CLEAR AND WAIT OPERATION WITH A SINGLE INSTRUCTION

William C. Bruce, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 929,629, Jul. 31, 1978, abandoned. This application Mar. 2, 1981, Ser. No. 239,269

Int. Cl.³ G06F *9/46*

U.S. Cl. 364—200 **5 Claims**



1. A method of performing a clear and wait operation with a single instruction in a processor having a plurality of programmable registers including a condition code register, by performing the following steps in response to a clear and wait instruction ANDing an immediate byte with contents of the condition code register so that the condition code register may be cleared if desired, the immediate byte being obtained from a preselected memory location; inhibiting a non-maskable interrupt during the ANDing of the immediate byte with the contents of the condition code register; stacking the plurality of programmable registers to save the state of the processor at time of performing the clear and wait operation; and waiting for an interrupt to occur so the interrupt can be directly serviced, and returning the processor to normal program execution after servicing the interrupt, thereby having performed a clear and wait operation with a single instruction.

4,409,654

DATA PROCESSOR ADAPTED FOR INTERRUPTION TO AN INSTRUCTION STREAM

Kenichi Wada, Zama, and Naoki Yamada, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,370

Claims priority, application Japan, Mar. 7, 1980, 55-28140

Int. Cl.³ G06F *9/30*

U.S. Cl. 364—200 **6 Claims**

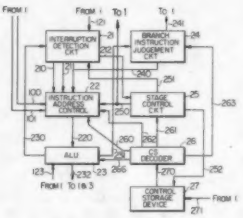
1. An information processing system comprising:

instruction means for sequentially decoding a plurality of instructions to generate the address of the next sequential instruction and to additionally generate, when the decoded instruction is a branch instruction, a branch-to address of said decoded branch instruction;

means for generating an interrupt signal for various types of interrupt requests at a timing depending on the type of interrupt request;

execution means connected to said instruction means for sequentially executing operations of said decoded instructions, when no interrupt signal is recieved from said interrupt generating means, including means for providing a first signal to said instruction means in response to completion of the operation of each of said decoded instructions for fetching from said instruction means a next sequential instruction address for an instruction to be next executed and means for providing a second signal to said instruction means, when a branch instruction is executed and the branch is successful, to fetch a branch-to address of said branch instruction from said instruction means;

a plurality of registers;



input pointer means for generating a pointer signal whose value indicates one of said registers, including means for storing any of said next sequential instruction address and said branch-to address, as fetched, in the register indicated by said pointer signal, and means for sequentially and cyclically changing said pointer value in response to one of said first and second signals for indicating said registers sequentially and cyclically;

delay means connected to said input pointer means for receiving the pointer signal and producing it at a predetermined time delay;

control means connected to receive said first, second and interrupt signals and for producing a third signal at a timing which is determined by said first, second and interrupt signals;

latch means for latching said delayed pointer signal in response to said third signal; and

means for reading the address out of one of said registers indicated by the delay pointer signal latched by said latch means.

4,409,655

HIERARCHIAL MEMORY RING PROTECTION SYSTEM USING COMPARISONS OF REQUESTED AND PREVIOUSLY ACCESSED ADDRESSES

Steven Wallach, Framingham; Kenneth D. Holberger, North Grafton; David L. Keating, Natick, and Steven M. Staudaher, Northboro, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 25, 1980, Ser. No. 143,981

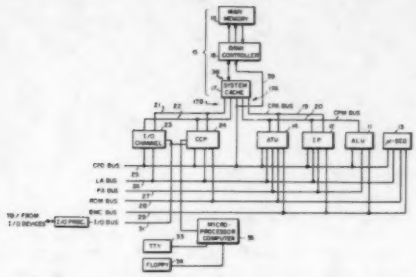
Int. Cl.³ G06F *9/00, 9/32, 9/34*

U.S. Cl. 364—200 **9 Claims**

1. In a data processing system which utilizes memory storage means for storing a plurality of different groups of data, said memory storage means being capable of storing said different groups of data at different designated locations thereof, said designated locations being identifiable as storage segment locations, said locations being designated by successive segment nembers and having a descending order of protection

with respect to data reference accesses by an operator such that the degree of protection of a segment location becomes successively higher as the segment number thereof becomes successively lower, the addresses of data in each group thereof being accompanied by a plurality of selected bits which identify the storage segment location in which said data is stored, said system comprising

comparing means for responding to said selected bits which accompany an address and which identify the storage segment location at which a data reference access is being



requested to compare said selected bits with a plurality of selected bits which accompany a current address and which identify the storage segment location at which currently requested data reference access has already been provided with respect to said current address; and

means responsive to said comparing means for prohibiting a data reference access to an address at a storage segment location which the selected bits of the address at which said data reference is being requested identify as a segment location having a higher segment number than the segment number of the selected bits of said current address.

4,409,656

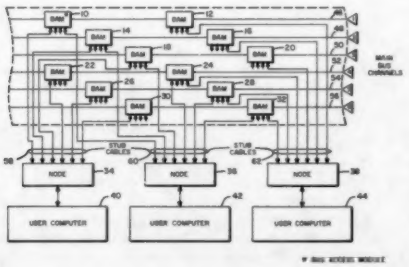
SERIAL DATA BUS COMMUNICATION SYSTEM

Steven C. Andersen, Prior Lake; Thomas P. Penkauskas, Eagan; James W. Kassel, St. Paul, and Stephen O. Newcomer, Apple Valley, all of Minn., assignors to Her Majesty the Queen, in right of Canada as represented by the Minister of National Defense, Ottawa, Canada

Continuation of Ser. No. 130,125, Mar. 13, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 333,068

Int. Cl.³ G06F *3/04, 5/04, 9/22, 11/20*

U.S. Cl. 364—200 **25 Claims**



1. In a serial data bus transmission system of the type used to interconnect a plurality of user devices for message intercommunication over transmission cables, said system including a plurality of cables, one of which acts as an active control cable and one of which acts as an active message cable at a given time, with at least one bus access module coupled to each of said plurality of cables, a plurality of node devices for coupling said user devices to said bus access modules, each of said node devices comprising in combination:

(a) bus input/output means including data format conversion means coupled to said bus access modules for selecting said active ones of said control cable and said message cable and for transmitting or receiving digital messages and control signals therethrough;

(b) a control bus coupled to said bus input/output means;

(c) a message bus coupled to said bus input/output means;

(d) control line sequencer means coupled to said control bus for receiving control signals therefrom and including logic means for performing preprocessing functions relative to said control signals for determining whether said control signals are intended to affect that node device and are of a proper format;

(e) controller means adapted to receive preprocessed data signals from said control line sequencer and to develop command signals in accordance with said preprocessed data signals, and further status indicators;

(f) means including said control bus and said bus input/output means for sending said command signals on said active control cables to other of said plurality of nodes coupled to said active control cable; and

(g) means responsive to said command signals for controlling the flow of messages over said message bus and between said plurality of user devices.

4,409,657

TIME CLOCK FOR RECORDING THE IDENTIFICATION OF A PERSON

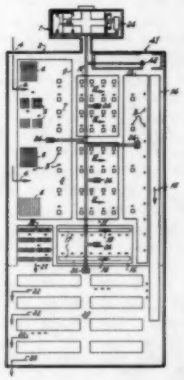
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed May 4, 1981, Ser. No. 260,381

Claims priority, application Netherlands, May 20, 1980, 8002895

Int. Cl.³ G06F *15/21;* **G07C** *1/00*

U.S. Cl. 364—401 **21 Claims**



1. A time clock system for recording and communicating between management and workers, work being performed during time periods, comprising a management office and a plurality of work stations, electronic circuits connecting said office and said work stations for transmitting data between them, said work stations adapted to receive work orders from said management office via said circuits, a time clock at said station, said clock having means that records the work orders and information as to the identification of the worker carrying out said work orders, said clock being positioned to receive said information concerning said worker from card means and record said information.

4,409,658
APPARATUS FOR LANDING LOADS FROM TRANSPORT AIRCRAFT, ESPECIALLY LOW FLYING AIRCRAFT

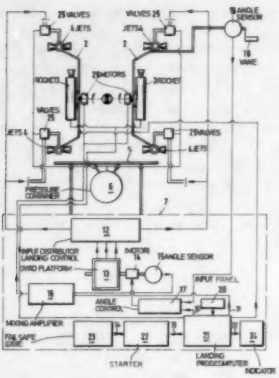
Hans Beusse, Hamburg, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 872,827, Jan. 27, 1978, abandoned. This application Jun. 26, 1979, Ser. No. 52,426

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704650

Int. Cl.³ G06G *7/78*; G06F *15/50*; B64D *1/02*

U.S. Cl. 364—424 **13 Claims**



1. A load landing system for discharging a load from an aircraft and landing said load on the ground, comprising frame means, means releasably securing said frame means to said load, rocket means operatively secured to said frame means, servomotor means operatively connected to said rocket means for tilting said rocket means, gyro platform means supported by said frame means, steering nozzle means supported by said frame means, closed loop control amplifier means operatively connecting said steering nozzle means to said gyro platform means for operating said steering nozzle means for the position control of the landing apparatus, computer means, keyboard input means operatively connected to said computer means for supplying input values to the computer means, said input values including values representing the horizontal starting speed of the load, the predetermined horizontal touchdown speed, and the mass of the load as it is starting from the aircraft, said computer providing output values including a tilting sequence for said rocket means, the operating duration of said rocket means and the dropping altitude above ground; said landing system further comprising logic circuit means operatively connected to the landing system for checking the landing system to provide clearance signals representing the operability of the landing system and given operating conditions, and pressure supply means operatively connected to said steering nozzle means.

4,409,659
PROGRAMMABLE POWER SUPPLY FOR ULTRASONIC APPLICATIONS

Janet Devine, Downingtown, Pa., assignor to Sonobond Ultrasonics, Inc.

Filed Dec. 15, 1980, Ser. No. 216,081

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—475 **20 Claims**

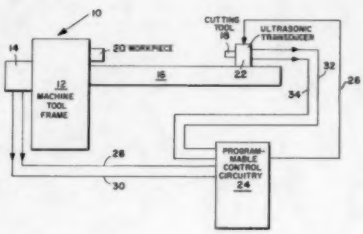
1. In a method of metalworking comprising the steps of:

(a) providing relative interfering motion between a metal workpiece and a cutting tool whereby said cutting tool cuts said workpiece; and

(b) vibrating said tool, by application thereto of ultrasonic vibratory energy, to enhance tool cutting action:

the improvement comprising:

(c) sensing a physical parameter indicative of progress of said tool in cutting said workpiece while said tool is cutting and workpiece; and



(d) changing vibrational amplitude of said tool, while said tool is cutting said workpiece, in response to a continuously mathematically calculated relationship between said sensed physical parameter and previous observations of said sensed physical parameter by continously reinitiating said mathematical calculations until and after said parameter is within preselected limits indicative of satisfactory progress of said tool cutting said workpiece.

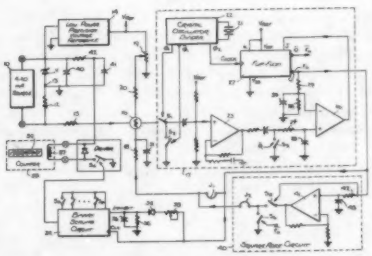
4,409,660
ELECTRONIC TOTALIZER

Herbert A. Shauger, Doylestown, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Mar. 3, 1981, Ser. No. 240,229

Int. Cl.³ G01G *9/00*

U.S. Cl. 364—510 **11 Claims**



1. A totalizer usable in conjunction with a transducer responsive to a process variable such as flow rate to produce a varying current signal in a predetermined range, the totalizer providing a readout indicative of the time-integrated total of the process variable in units of measurement appropriate thereto which in the case of liquid flow rate may be liters, tons or other measuring units, said totalizer comprising:

A input means to convert the current signal into a voltage signal proportional to the process variable;

B a voltage-to-frequency converter coupled to said input means for converting the voltage signal into pulses at a rate that is a function of the signal magnitude, the pulse frequency being relatively high at the upper limit of the range;

C a selectively adjustable digital scaler responsive to the converter pulses to provide output pulses at a scaled-down rate selected to yield the desired unit of measurement; said scaler being formed by a binary scaling circuit having a series of switches to select the desired scale-down factor, said binary scaling circuit having an inhibit-

ing network connected thereto to prevent response to converter pulses representing a transducer current signal below said range; and

D a counter responsive to the scaler output pulses to provide said readout.

4,409,661

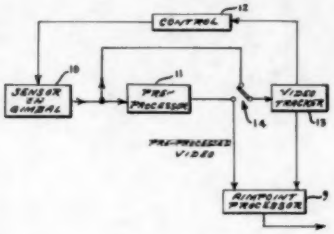
AIMPOINT SELECTION PROCESSOR

John G. Romanski, Kingsville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 68,817, Aug. 22, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,362

Int. Cl.[3] **G06F** *15/58;* **H04N** *3/00, 7/18*

U.S. Cl. 364—516 **4 Claims**



1. In a video tracking system having a digital correlation tracker, an imaging sensor, video preprocessor means for spatial and amplitude quantizing of the sensor image into pixels and gray levels and means for computing target discriminant functions therefrom, the improvement residing in an aimpoint selection processor, said aimpoint selection processor comprising

image binary coding means for developing binary target patterns from said discriminant functions,

a moment measuring circuit, responsive to said discriminant functions and the output of said image binary coding means, for measuring the moments of said binary target patterns,

a microprocessor said microprocessor being programmed to: (a) generate and store, from initial binary coding and moment measurement data, a target reference pattern data base defining target pattern size, aspect angle, selected aimpoint and reference points; (b) compute, from real time binary coding and moment measurement data and said reference pattern data base, an ensemble of estimated aimpoints; and (c) average said estimated aimpoints to provide an output aimpoint signal, and

data bus means operably connected to said image binary coding means, said moment measuring circuit and said microprocessor.

4,409,662

PROGRAMMABLE DIGITAL TEMPERATURE CONTROLLER

Prabhakar P. Rao, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 29, 1980, Ser. No. 221,008

Int. Cl.[3] **G05D** *23/00*

U.S. Cl. 364—557 **11 Claims**

1. An apparatus for controlling a temperature device, comprising:

heat mode select switch means for placing said apparatus in a heat mode of operation from which one of three selectable states can be entered;

automatic state select switch means for placing said apparatus in an automatic operation state when said apparatus is placed in said heat mode;

isothermal state select switch means for placing said apparatus in an isothermal operation state when said apparatus is placed in said heat mode;

manual state select switch means for placing said apparatus in a manual operation state when said apparatus is placed in said heat mode;

information entry switch means for providing manually selectable numerical data to said apparatus;

temperature information select switch means for directing said apparatus to receive manually selectable temperature information from said information entry switch means;

time information select switch means for directing said apparatus to receive manually selectable time information from said information entry switch means;

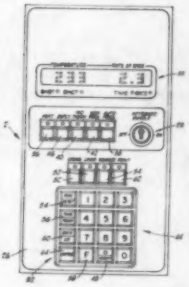
rate information select switch means for directing said apparatus to receive manually selectable rate information from said information entry switch means;

casing data select switch means for instructing said apparatus to utilize predetermined casing temperature and casing time parameters stored in a memory of said apparatus;

liner data select switch means for instructing said apparatus to utilize predetermined liner temperature and liner time parameters stored said memory;

squeeze data select switch means for directing said apparatus to utilize predetermined squeeze temperature ans squeeze time parameters stored said memory;

means, responsive to the sequential actuation of said heat mode select switch means, said automatic state select



switch means, one of said casing data select switch means, liner data select switch means, or squeeze data select switch means, said information entry switch means, said rate information select switch means, and said information entry switch means, for controlling the temperature device using the predetermined temperature and time parameters selected by the actuation of one of said casing data select switch means, said liner data select switch means or said squeeze data select switch means;

means, responsive to the sequential actuation of said heat mode select switch means, said isothermal state select switch means, said temperature information select switch means, and said information entry switch means, for controlling the temperature device to reach a selectable temperature as selected by the actuation of said temperature information select switch means and said information entry switch means;

means, responsive to the sequential actuation of said heat mode select switch means, said manual state select switch means, one of said casing data select switch means, liner data select switch means, or squeeze data select switch means, said information entry switch means, and either said temperature information select switch means and said information entry switch means or said time information select switch means and said information entry switch means, for controlling the temperature device in an automatic with partial override substate wherein the predeter-

mined temperature and time parameters selected by the actuation of one of said casing data select switch means, said liner data select switch means, or said squeeze data select switch means are overridden by the temperature or time data manually selected by the actuation of one of said temperature information select switch means and said information entry switch means or said time information select switch means and said information entry switch means;

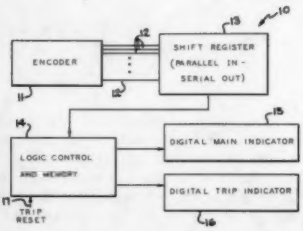
means, responsive to the sequential actuation of said heat mode select switch means, said manual state select switch means, said temperature information select switch means, said information entry switch means, said time information select switch means and said information entry switch means, for controlling the temperature device to achieve a temperature selected by the actuation of said temperature information select switch means and said information entry switch means in a time selected by the actuation of said time information select switch means and said information entry switch means; and

means, responsive to the sequential actuation of said heat mode select switch means, said manual state select switch means, said rate information select switch means, said information entry switch means, said temperature information select switch means, and said information entry switch means, for controlling the temperature device to achieve a temperature selected by the actuation of said temperature information select switch means and said information entry switch means at a rate selected by the actuation of said rate information select switch means and said information entry switch means.

4,409,663
DIGITAL ODOMETER

James Becker, Ann Arbor, and Daniel L. Neill, Belleville, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Dec. 22, 1980, Ser. No. 219,199
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—561 **4 Claims**

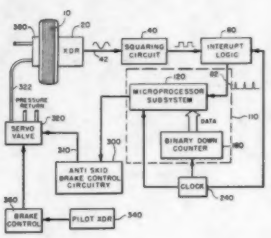


1. A digital odometer for a vehicle comprising mechanical encoder means located in the vicinity of and mechanically connected to be driven by the transmission of said vehicle, said encoder means including a plurality of rotatable encoder discs, means for incrementally rotating said discs by a predetermined amount for each unit of distance travelled by the vehicle, means for sensing and supplying digital electrical data signals corresponding to the rotational position of each of said discs as an indication of the total distance of travel of the vehicle, logic means including a first memory for receiving said data in digital form, and first digital indicator means for displaying data stored in said first memory, said indicator means being located for convenient viewing from the driver's area of the vehicle, said logic means and said first memory being wire connected to said transmission-located encoder, said logic means further including a second memory, manually controlled means for clearing said second memory, and program control means for incrementing the count stored in said second memory by a predetermined amount each time the contents of said first memory are incremented by such predetermined amount, and including second digital indicator means for displaying the count stored in said second memory.

4,409,664
DIGITAL WHEEL SPEED SENSOR

Thomas Skarvada, Woodland Hills, Calif., assignor to Crane Co., Chicago, Ill.

Division of Ser. No. 80,123, Sep. 27, 1979, Pat. No. 4,270,176.
This application Mar. 5, 1981, Ser. No. 240,902
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ G06F *15/20*; B60T *8/00*
U.S. Cl. 364—565 **10 Claims**



4. In a brake control system including a rotatable wheel and means, responsive to the wheel, for generating a periodic wheel signal having a frequency indicative of the rotational behavior of the wheel, an apparatus for precisely measuring the time duration of one or more cycles of the wheel signal comprising:

clock means for generating a periodic clock signal;

first counter means for maintaining a count indicative of clock signal cycles;

second counter means for maintaining a count indicative of wheel signal cycles;

gating means for selectively enabling and disabling the first and second counter means, said gating means responsive both to a control signal and to the phase angle of the wheel signal, such that, when the control signal is in a first state, the first and second counter means are consistently enabled at a predetermined phase angle of the wheel signal and, when the control signal is in a second state, the first and second counter means are consistently disabled at the same predetermined phase angle of the wheel signal;

computer means, coupled to the first and second counter means and to the gating means, for generating the control signal to selectively control the gating means;

means, included in the computer means, for reading and storing the counts stored in the first and second counter means at a first time;

means, included in the computer means, for placing the control signal in the first state at a second time, subsequent to the first time, to cause the gating means to enable the first and second counter means at the next occurrence of the predetermined phase angle of the wheel signal;

means, included in the computer means, for placing the control signal in the second state at a third time, subsequent to the second time, to cause the gating means to disable the first and second counter means at the next occurrence of the predetermined phase angle of the wheel signal;

means, included in the computer means, for determining whether the first and second counter means have been disabled;

means, included in the computer means, for reading and storing the counts stored in the first and second counter means at a fourth time, subsequent to the third time and

after the determining means has determined that the first and second counter means have been disabled;

means, included in the computer means, for calculating the difference between the count stored in the first counter means at the first and fourth times as a measure of elapsed time; and

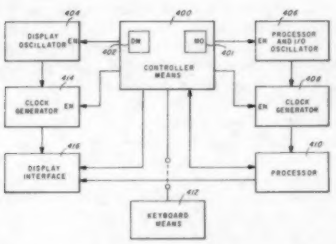
means, included in the computer means, for calculating the difference between the count stored in the second counter means at the first and fourth times as a measure of the number of wheel signal cycles occurring during the elapsed time.

4,409,665

TURN-OFF-PROCESSOR BETWEEN KEYSTROKES

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1979, Ser. No. 106,430
Int. Cl.³ G06F *1/04*
U.S. Cl. 364—707 **2 Claims**



1. An electronic data processing system comprising:

(a) operator input means including means for generating an ON signal, an OFF signal and a plurality of operation signals; and

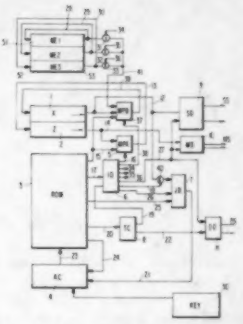
(b) integrated circuit means, connected to said operator input means, having a process only mode, a display only mode, a process and display mode and an off mode, said integrated circuit means including (i) controller means having means for selectively generating inactive first and second control outputs when said integrated circuit means is in the off mode, means for selectively generating an active first control output and an inactive second control output when said integrated circuit means is in the process only mode, means for selectively generating an inactive first control output and an active second control output when said integrated circuit means is in the display only mode and means for selectively generating active first and second control outputs when said integrated circuit means is in the process and display mode, and (ii) clock generator means, connected to said controller means, including first means for selectively generating first clock outputs in an active cycling state in response to said active first control output and in an inactive predefined steady state in response to said inactive first control output and second means for selectively generating second clock outputs in an active cycling state in response to said active second control output and in an inactive predefined steady state in response to the inactive second control output.

4,409,666

ELECTRONIC DESK-TOP CALCULATOR WITH INDICATION FUNCTION OF STORED DATA RANGE

Yukihiro Nishiguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 72,816, Sep. 5, 1979, abandoned. This application Jun. 9, 1981, Ser. No. 271,905
Claims priority, application Japan, Sep. 5, 1978, 53-109455
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—710 **20 Claims**



1. An electronic calculator comprising: a plurality of first memory means for independently storing data, key means, second memory means, a plurality of transfer means respectively coupled between said first memory means and said second memory means, first means responsive to actuation of said key means for selectively enabling one of said transfer means to transfer data stored in an associated one of said first memory means to said second memory means, third memory means for storing address information of said associated one of said first memory means, first display means coupled to said second memory means for displaying data stored in said second memory means, second display means having a plurality of display patterns provided in correspondence to said plurality of first memory means respectively, second means responsive to said address information stored in said third memory means for operatively energizing one of said display patterns, means for determining if the content of said associated one of said first memory means is outside a predetermined range, third means for supplying a data representing said predetermined range to said determining means, fourth means for supplying the content of said second memory means to said determining means, and fifth means responsive to said determining means for controlling said second means when the content of said associated one of said first memory means is outside of said predetermined range to render the energizing manner of said one of said display patterns distinguishable from the energizing manner when the content of said associated one of said first memory means is within said predetermined range.

4,409,667

PROCESS AND DEVICE FOR THE DERIVATION OF AN ANALOG ELECTRIC SIGNAL

Pierre Ricaud, Colomiers, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed May 21, 1981, Ser. No. 265,812
Claims priority, application France, Jun. 4, 1980, 80 12381
Int. Cl.³ G06F *7/48*; G06J *1/00*
U.S. Cl. 364—732 **12 Claims**

1. Process for obtaining the derivative of an analog electric signal P varying slowly as a function of a variable t, comprising the steps of:

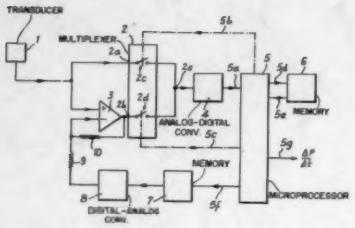
converting a first analog value P_1 taken by the signal P for a first value t_1 of the variable t to a first digital value;

reconverting said first digital value to an analog value P_{12} representative of P_1;

forming a first analog difference $\delta P = P_1 - P_{12}$;

converting δP to a second digital value;

forming a second analog difference $(P_2 - P_{12})$ by subtracting P_{12} from a second analog value P_2 taken by said signal P for a second value t_2 of the variable t;



converting said second analog difference to a third digital value;

subtracting said second digital value from said third digital value to form a digital difference $\Delta P = P_2 - P_1$; and

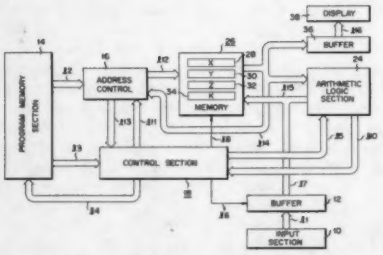
dividing ΔP by the digital value of the difference $\Delta t = t_2 - t_1$ between said values t_2 and t_1 of said variable t.

4,409,668

ROUND-OFF APPARATUS FOR DATA PROCESSORS

Junichi Yoshida, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1981, Ser. No. 242,142
Claims priority, application Japan, Mar. 24, 1980, 55-37223
Int. Cl.³ G06F 7/48
U.S. Cl. 364—745 **4 Claims**



1. A round-off apparatus for data processors which carry out a series of arithmetic operations to approach a solution with increasing degrees of accuracy, the rounding-off apparatus comprising:

first storage means for storing the (i)th result of a series of arithmetic operations of a data processor by which a solution is gradually approached with increasing degrees of accuracy;

second storage means for storing the (i+1)th result of said series of arithmetic operations;

detecting means coupled to said first and second storage means for computing the difference between said (i)th result and said (i+1)th result and detecting the highest non-zero digit (n) of the computed difference;

third storage means coupled to said detecting means for storing said highest non-zero digit (n); and

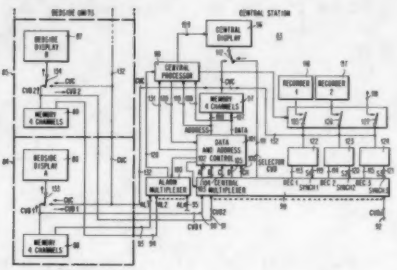
rounding-off means coupled to said second and third storage means for rounding-off said (i+1)th result to the (n+1)th digit.

4,409,669

SIGNAL PROCESSING DEVICE

Leopold Neumann, Lexington, and Richard B. Kline, II, Stoneham, both of Mass., assignors to Siemens AG, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,763
Int. Cl.³ G06F 3/04
U.S. Cl. 364—900 **16 Claims**



1. A signal processing apparatus comprising:

(1) a main unit having

(a) a frame;

(b) a signal processing means located in said frame;

(c) a conversion pulse clock generator of predetermined clock frequency located in said frame and having an output for conversion pulses;

(2) a plurality of modules replaceably inserted into said frame of said main unit, each of said modules having

(a) a module input for analog signals;

(b) a module output connectable with said signal processing means of said main unit;

(c) an analog-to-digital converter connected between said module input and said module output for converting said analog signals into digital output data, which analog-to-digital converter comprises a conversion clock input connectable with said output of said conversion pulse clock generator of said main unit;

(d) an identification signal generator connected to said module output for generating a module identification signal in form of a sequence of digital pulses which module identification signal is different from each module;

wherein said conversing pulse clock generator in said main unit is provided for clocking each of said analog-to-digital converters of said replaceable modules with said conversion pulses for the execution of convertions of said analog signals in a fixed sequence, regardless of the relative spatial correlation in which said modules are inserted into said main frame, said analog-to-digital converters thereupon generating said digital output data from said analog input signals for being transmitted to said signal processing means in said main unit, and wherein said identification signals of said identification signal generators are provided for being transmitted together with said digital output data of said analog-to-digital convertors to said signal processing means in said main unit, and wherein each of said replaceable modules comprises a plurality of signal channels connected to said module input and a plurality of switches, said switches connecting said signal channels to said analog-to-digital converter for the purpose of executing analog-to-digital conversion with respect to said analog signals, and wherein said conversion pulse clock generator supplies a train of said conversion pulses which clock each of said analog-to-digital converters for the executions of conversions in said fixed sequence, and a train of switching pulses which actuate said switches in the sense that said individual signal channels are connected to and disconnected from said analog-to-digital converter in a predetermined sequence which sequence is

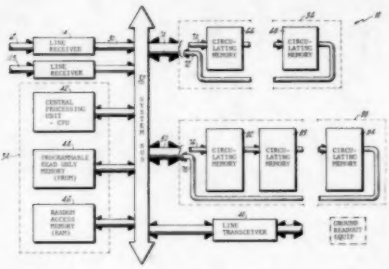
fixed, and wherein said signal channels are assigned to signals of different bandwidths, and wherein said switches connected to said signal channels are supplied with switching pulses of different switching frequencies such that a signal channel with a higher bandwidth is scanned more often than of signal channel with a lower bandwidth.

4,409,670

SOLID-STATE DIGITAL FLIGHT DATA RECORDER

James A. Herndon, Suffield, and Henry R. Ask, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 26, 1981, Ser. No. 277,545
Int. Cl.³ G11B 5/02; G09F 3/00
U.S. Cl. 364—900 **17 Claims**



1. A digital flight data recorder for recording units of signal information representing repetitively sampled aircraft operating parameters presented in series repeating data frames within a recording time period, comprising:

minor memory means, having an input for receiving each series data frame and having an output, said minor memory circulating each received data frame therethrough, as received, in a preserved first-in first-out (FIFO) sequence to said output, whereby the current data frames circulating therethrough represent the information received in a most recent value real time interval less than the recording time period;

major memory means, having an input and an output, for circulating in FIFO sequence selected units of information presented to said input therethrough to said output; and

signal processing means, responsive to said minor memory means and said major memory means, for compressing said received series data frames appearing at said minor memory output so as to select therefrom successive ones of said received data frames as said selected units of information and to present said selected units of information to said major memory means, whereby said selected units of information in said major memory are represent the units of information received in the recording time period and said series data frames in said minor memory represent the units of information received within a most recent time interval of the recording period.

4,409,671

DATA PROCESSOR HAVING SINGLE CLOCK PIN

R. Gary Daniels, Round Rock, Tex.; Thomas H. Bennett, Scottsdale, Ariz.; Fuad H. Musa, Austin, and Michael F. Wiles, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 939,722, Sep. 5, 1978, abandoned. This application Aug. 24, 1981, Ser. No. 295,912
Int. Cl.³ G06F 1/04
U.S. Cl. 364—900 **1 Claim**

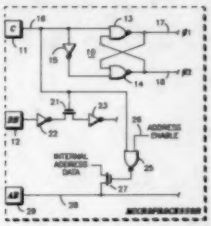
1. A monolythic integrated circuit microprocessor comprising:

a single clock input terminal for receiving an externally generated clock signal which changes between first and second states at a predetermined frequency;

timing signal generating means coupled to the single clock input terminal, for generating first and second complementary, non-overlapping timing signals having substantially the same frequency as said clock signal but delayed relative thereto by first and second predetermined skews, respectively;

at least one data input terminal for receiving an externally generated input data signal;

input gating means coupled to the single clock input terminal and to the one data input terminal, for latching the state of the input data signal in response to said clock signal



changing from a selected one of said states to the other of said states;

at least one address output terminal for providing an internally generated output address signal; and

output gating means coupled to the single clock input terminal and to the one address output terminal and responsive to an internally generated address enable signal, for selectively coupling the internally generated output address signal to the one address output terminal in response to the clock signal changing to said selected one of said states from the other of said states;

whereby the microprocessor latches the state of the input data signal and provides the output address signal with minimum skew relative to the clock signal.

4,409,672

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 31, 1981, Ser. No. 249,702
Claims priority, application Japan, Mar. 31, 1980, 55-41810
Int. Cl.³ G11C 11/40, 11/24
U.S. Cl. 365—149 **8 Claims**

1. A semiconductor memory device operatively connected to receive address signals and clock signals, said device comprising:

first and second power supplies, the potential of said second power supply being lower than said first power supply potential;

a plurality of word lines;

a plurality of power supply lines;

a plurality of pairs of bit lines;

a plurality of sense amplifiers, respective of said sense amplifiers operatively connected between a corresponding pair of said pairs of bit lines;

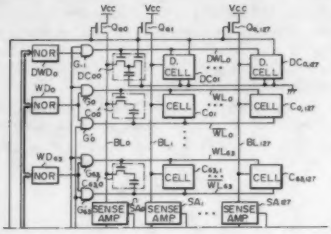
a plurality of memory cells, each comprising

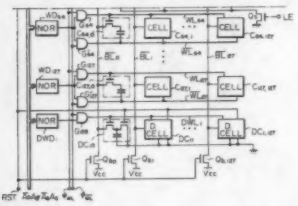
a transistor having a gate connected to a corresponding one of said word lines, a drain connected to a corresponding one of said bit lines, and a source,

a capacitor having a predetermined capacitance and an electrode connected to the source of said transistor and another electrode connected to a corresponding one of said power supply lines; and

clock means operatively connected to said power supply

lines and to said word lines, for selectively supplying a clock signal to corresponding of said power supply lines in response to said address signals and after the potential of





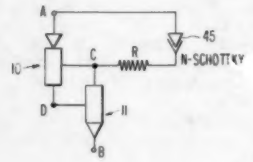
said corresponding word line rises and before the potential of said corresponding word line falls, the potential of said clock signal falls and after that, rises.

4,409,673

SINGLE ISOLATION CELL FOR DC STABLE MEMORY

Shashi D. Malaviya, Fishkill, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,651
Int. Cl.³ G11C *11/34*
U.S. Cl. 365—180 **16 Claims**



1. A fully selectable static memory cell capable of writing either one of two information states or reading either one of two information states and contained within a single isolated region comprising:

a substrate supporting a P-type semiconductor,

means for isolating a region of said semiconductor,

an N^+ sub-collector within said isolated region,

a first NPN transistor within said region including said sub-collector, a P-type NPN base region and an N-type NPN emitter region, a parasitic PNP transistor within said region, said parasitic PNP transistor including a base region comprising said NPN collector and a collector region comprising said NPN base region,

controllable word and bit lines in said isolated region, and

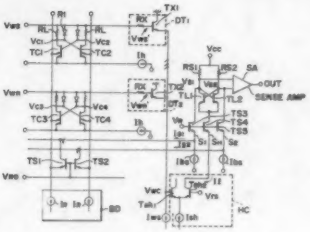
coupling means for coupling said word lines to said transistors and for coupling each of said bit lines to both said first and second transistors for operating said transistors as an SCR latch to read the information state of said latch or to write either of said information states regardless of the pre-existing state of said latch in response to read and write signals on said word and bit lines.

4,409,674

SEMICONDUCTOR MEMORY

Yukio Takahashi, Sakata, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 22, 1980, Ser. No. 180,453
Claims priority, application Japan, Aug. 23, 1979, 54-107394
Int. Cl.³ G11C *7/06*
U.S. Cl. 365—190 **5 Claims**



2. A semiconductor memory which is provided with a memory cell array composed of a plurality of memory cells, word lines and bit lines for selecting a desired one of the memory cells, comprising:

a detector circuit for detecting a read current of the selected memory cell of said memory cell array;

means included as part of said detector circuit for providing hysteresis characteristics thereto so that said detector circuit can retain data read immediately before; and

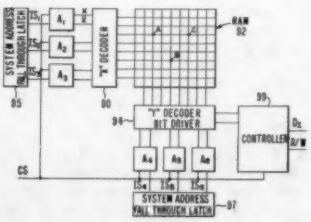
means for monitoring the potentials of said word lines and effecting a flow of current for providing the aforesaid hysteresis characteristics only when all the word line potentials are lower than a predetermined potential.

4,409,675

ADDRESS GATE FOR MEMORIES TO PROTECT STORED DATA, AND TO SIMPLIFY MEMORY TESTING, AND METHOD OF USE THEREOF

Jonathan J. Stinebelfer, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Dec. 22, 1980, Ser. No. 219,294
Int. Cl.³ G11C *7/00, 29/00*
U.S. Cl. 365—201 **1 Claim**



1. A method of addressing a random access memory comprising in order the steps of:

addressing the memory at a particular address; addressing the memory at an address other than said particular address;

(i) addressing the memory at said particular address;

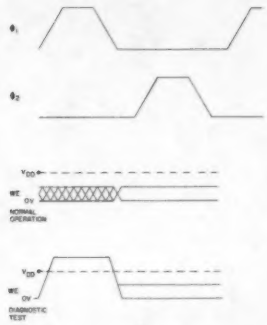
(ii) addressing the memory at an address not previously addressed and other than said particular address, and repeating said steps (i) and (ii) until all addresses in the memory have been addressed.

4,409,676

METHOD AND MEANS FOR DIAGNOSTIC TESTING OF CCD MEMORIES

Ramesh C. Varshney, San Jose, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Feb. 19, 1981, Ser. No. 235,804
Int. Cl.³ G11C *29/00*
U.S. Cl. 365—201 **4 Claims**



1. In a charge coupled memory device having a reference voltage node for receiving a reference voltage and a first and a second external pin for receiving a first and a second external control signal, respectively, a memory testing apparatus comprising:

means coupled to said reference voltage node and said first and second external pins which is responsive to a control signal applied to said first external pin for connecting said reference voltage node to said second external pin.

4,409,677

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yoshihiro Takemae, Yokohama, and Masao Nakano, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

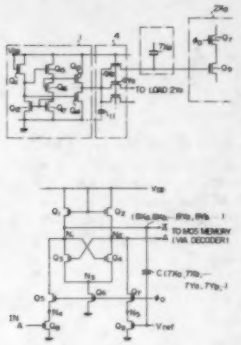
Filed Dec. 17, 1979, Ser. No. 103,925
Claims priority, application Japan, Dec. 23, 1978, 53-161648; Dec. 23, 1978, 53-161649
Int. Cl.³ G11C *7/02*
U.S. Cl. 365—206 **15 Claims**

1. A semiconductor integrated circuit device including a semiconductor portion, a constant voltage reference circuit to generate a constant reference voltage and at least two load circuits which receive said constant reference voltage, said device comprising:

at least two noise limiters, each having two terminals, a first of said two terminals of each said noise limiter being commonly connected to the output terminal of said constant voltage reference circuit, the second one of said two terminals of the first one of said noise limiters being connected to at least a first one of said load circuits, the second one of said two terminals of a second one of said noise limiters being connected to at least a second one of said load circuits, and the impedance of each said noise limiter being at least approximately as large as the output impedance of said constant voltage reference circuit;

wherein all of the load circuits connected to said second terminal of each said noise limiter are operated at a respective time that is different from the time of operating each load circuit connected to the second terminal of each other of said noise limiters; and

wherein a noise signal that appears at said input of each one of said load circuits connected to one of said noise limiters,



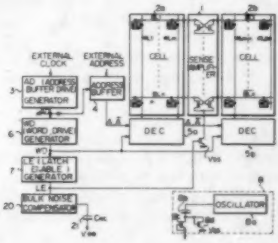
associated with the operation of one of these load circuits, is suppressed from effecting the value of said constant reference voltage that is applied to the inputs of each of said load circuits connected to the other noise limiters.

4,409,678

SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, and Fumio Baba, both of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 13, 1981, Ser. No. 234,195
Claims priority, application Japan, Feb. 16, 1980, 55-18358
Int. Cl.³ G11C *7/02*
U.S. Cl. 365—206 **5 Claims**



1. A semiconductor memory device, operatively connected to receive a cancelling voltage, comprising:

a semiconductor substrate having a predetermined bias voltage applied thereto;

a sense amplifier;

a pair of bit lines operatively connected to said sense amplifier;

memory cells formed on said semiconductor substrate and operatively connected to said pair of bit lines; and

a capacitance formed on said semiconductor substrate and operatively connected to receive said cancelling voltage, wherein the predetermined bias voltage is applied to the semiconductor substrate and a reading operation is performed by amplifying through said sense amplifier a voltage difference caused between said pair of bit lines due to access to one of said memory cells, and wherein said cancelling voltage of a phase reverse to that of a noise disturbing said predetermined bias voltage applied to said

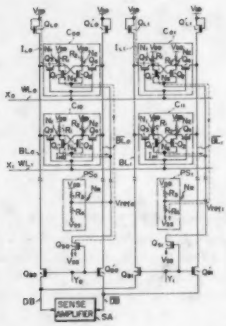
semiconductor substrate is applied to said semiconductor substrate through said capacitance.

4,409,679

STATIC MEMORY CIRCUIT

Setsuo Kurafuji, Yokohama, and Kazuo Tanimoto, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 26, 1981, Ser. No. 247,748
Claims priority, application Japan, Mar. 26, 1980, 55-38537
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—227 **8 Claims**



1. A static memory circuit, operatively connectable to receive column selection signals, comprising:

a first power supply;

a second power supply the potential of which is lower than that of said first power supply;

a plurality of word lines;

a plurality of pairs of bit lines;

a plurality of pairs of column selection gate transistors, each pair operatively connected to one of said plurality of pairs of bit lines and controlled by said column selection signals;

a plurality of memory cells each of which comprises:

a pair of first loads operatively connected to said first power supply;

first and second transistors each having a gate operatively connected both to a respective one of said first loads and to a drain of the other transistor of said first and second transistors and each having a source operatively connected to a source of the other transistor of said first and second transistors; and

third and fourth transistors each having a drain operatively connected to one of the respective bit lines of a respective one of said pairs of bit lines, each having a source operatively connected to a respective one of the drains of said first and second transistors and each having a gate operatively connected to a respective one of said word lines; and

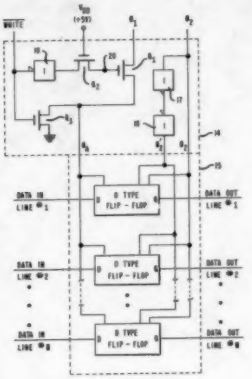
means, operatively connected to both the source of said first and second transistors of said memory cells and to said second power supply, for setting the potential of the sources of said first and second transistors of a selected one of said plurality of memory cells to be lower than those of non-selected ones of said plurality of memory cells.

4,409,680

HIGH SPEED WRITE CONTROL FOR SYNCHRONOUS REGISTERS

Vernon K. Schnathorst, Monument, and Gary T. Bastian, Colorado Springs, both of Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 27, 1981, Ser. No. 296,753
Int. Cl.³ G11C *8/00, 7/00*
U.S. Cl. 365—233 **4 Claims**



1. An electronic circuit for controlling data in a bank of D-type, master-slave flip-flops synchronized to a multiple phase clock, comprising:

a first field effect transistor having its drain electrode connected to receive a first phase signal from said clock, having its source electrode connected to said bank of flip-flops to control the entry of data into said bank of flip-flops, and having a gate electrode;

a bootstrapping field effect transistor having its source electrode connected to said gate electrode of said first field effect transistor, having its drain electrode connected to a source of write command signals, and having its gate electrode connected to a source of voltage which is substantially identical to said write command signals in magnitude; and

means for connecting said source electrode of said first field effect transistor to ground potential whenever a write command signal is absent.

4,409,681

TRANSDUCER

Ronald P. White, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 15, 1979, Ser. No. 20,572
Int. Cl.³ H04B *13/00*
U.S. Cl. 367—166 **15 Claims**

1. Apparatus for driving an element that has piston-like motion, said apparatus comprising:

a flextensional transducer having a hollow shell with interior side walls; and

fluid drive means including fluid communicating with said interior side walls and one side of said piston-like radiating element.

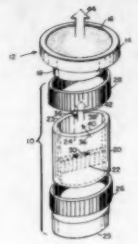
6. A transducer apparatus for converting flexural volume velocity flow to acoustic radiation comprising:

A. a fluid filled flextensional transducer having a hollow shell which contains said fluid, said fluid being acoustically coupled to an outside medium and to the inner wall of said shell; the outer wall of said shell being acoustically decoupled from said medium to prevent contact between the outer wall of said shell and said medium;

B. means for coupling the flexural vibrations of the inner wall

of said shell of said flextensional transducer to said outside medium; and

C. a driving element mounted between the inner walls of said shell, whereby the desirable frequency characteristics of said flextensional transducer are utilized and the radiating area of



said transducer is determined by the size of said coupling means.

8. The apparatus claimed in claim 6 wherein the outer wall of said shell is acoustically decoupled by being mounted on the hull of a ship.

4,409,682

DIGITAL EDITING SYSTEM FOR AUDIO PROGRAMS

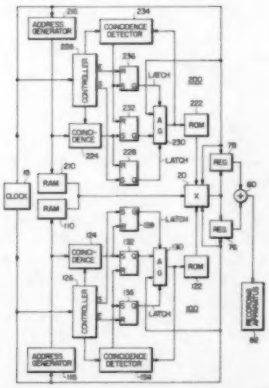
Toshinori Mori; Yoshiyuki Tsuchikane, and Takashi Matsushige, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Sep. 18, 1980, Ser. No. 188,273

Claims priority, application Japan, Sep. 18, 1979, 54-119616

Int. Cl.³ G09B *5/04;* **G06F** *3/16, 5/00*

U.S. Cl. 369—3 **6 Claims**



1. A digital editing system for combining first and second digitized analog signals into a third, continuous signal, comprising:

first and second digital memories in which said first and second digitized analog signals are respectively stored;

third and fourth digital memories in which first and second digital weighting factors are stored respectively, the first digital weighting factors representing a magnitude decreasing from unity to zero and stored in locations sequentially addressable as a function of time and the second digital weighting factors representing a magnitude increasing from zero to unity and stored in locations sequentially addressable as a function of time;

first, second, third and fourth address generators respectively associated with said first, second, third and fourth memories;

control means for initially causing said first and second address generators substantially simultaneously to retrieve the first and second digitized analog signals sequentially from sequential addresses generated thereby for said first and second digital memories and for subsequently causing said third and fourth address generators substantially simultaneously to retrieve the first and second digital weighting factors sequentially from said third and fourth digital memories when a predetermined address is reached by said first and second address generators;

means for multiyplying the retrieved first and second digitized analog signals respectively by digital magnitudes of unity and zero until said predetermined address is reached, and for subsequently multiplying the retrieved first and second digitized analog signals first by the retrieved first and second digital weighting factors, respectively, and thereafter by digital magnitudes of zero and unity, respectively; and

means for combining the multiplied first and second digitized analog signals to generate a combined digital signal.

4,409,683

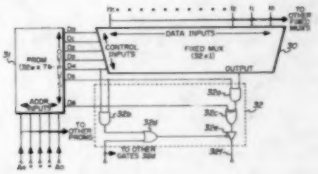
PROGRAMMABLE MULTIPLEXER

Thomas R. Woodward, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 18, 1981, Ser. No. 322,462

Int. Cl.³ H04J *3/02;* **H03K** *17/00*

U.S. Cl. 370—112 **10 Claims**



9. An improved programmable multiplexer circuit integrated on a semiconductor chip comprised of:

a plurality of fixed multiplexer means; each of said fixed multiplexer means including a plurality of data inputs, a plurality of control inputs, and an output for passing a signal from any one of said data inputs to said output in a fixed predetermined fashion in response to encoded signals on said control inputs; wherein

associated with each of said fixed multiplexer means is a programmable memory means for generating said encoded control signals by performing respective programmable transformations of an address that is the same for all of said memory means.

4,409,684

CIRCUIT FOR SYNCHRONIZING A TRANSMITTING-RECEIVING STATION TO A DATA NETWORK OF A DIGITAL COMMUNICATION SYSTEM

Gerhard Pooch, Emmering, and Hans-Juergen von der Neyen, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 289,102

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032296

Int. Cl.³ H04L *7/00*

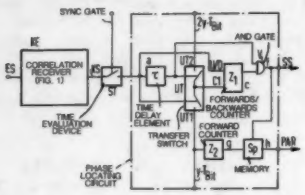
U.S. Cl. 375—116 **3 Claims**

1. In a circuit for synchronizing a transmitting/receiving station to the data network of a digital communication system which comprises a correlation receiver in the receiving device, the correlation receiver including a multi-stage time delay

chain in which the input data signals, composed of a data block containing code words inserted at determinate points of the data block as a Barker code, is delayed, the time delay chain including a plurality of parallel outputs each connected to an input of a respective multiplier, which multipliers can be set to the Barker code, and in which the multipliers have respective outputs which are connected to a majority decision circuit which is operable to provide a correlation signal for synchronization purposes, the improvement therein comprising:

synchronization means in said correlation receiver including a bit synchronization output and a block synchronization output for providing respective bit and block synchronization signals;

a regenerator including a plurality of inputs one of which is connected to receive the input data signal and including an output;



a phase shifter including an input for connection to said bit synchronization output, a control input, and an output connected to another one of said inputs of said regenerator for controlling the phase of the bit synchronization signals;

a first switch connected between said bit synchronization output and said input of said phase shifter;

a second switch connected between said block synchronization output and a further one of said inputs of said regenerator;

said first and second switches each including a control input; and

control means connected to said bit and block synchronization outputs and connected to said control inputs of said first and second switches and to said control input of said phase shifter, and operable to correct phase shift and connect said output synchronization outputs to said regenerator for synchronized operation of said regenerator.

4,409,685

METHODS AND TAXIMETERS FOR CALCULATING A TAXI FARE

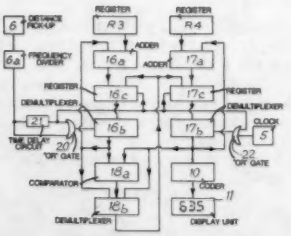
Claude F. Ricard, 10 Oliveraie G - Route de Nice, Aix-en-Provence, France 13100

Filed Jan. 27, 1981, Ser. No. 228,741

Claims priority, application France, Feb. 7, 1980, 80 02900

Int. Cl.³ G07B *13/00*; G06F *15/20*

U.S. Cl. 377—20 **6 Claims**



1. Method for calculating a taxi fare displayed on an electronic taximeter, according to which the distance travelled by the taxi is measured by means of a distance pick-up, which delivers a number of pulses proportional to said distance, and the duration of the taxi run is measured by means of an electronic clock which delivers pulses of constant and high frequency, wherein the taxi run is split into elementary portions of equal length, which is the constant distance travelled by the taxi between two successive pulses delivered by the distance pick-up; the number of pulses n1 delivered by the said clock during each elementary portion, i.e. between two successive pulses of the distance pick-up is counted; a constant number p2 which is the unit price of a travelled distance equal to the constant length of each portion, is compared after each portion, to a variable number n1.p1 which is the partial price of the portion obtained by multiplying the price p1 of a time unit equal to the period of the said clock, by the duration n1 of each portion; the highest of the two numbers then selected as partial price of the said elementry portion; and wherein the total fare is calculated by adding up the said partial prices.

4,409,686

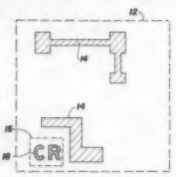
METHOD OF SERIALIZATION OF DICE

Kenneth A. Ports, Indialantic, and Justin E. Harlow, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 16, 1980, Ser. No. 159,750

Int. Cl.³ G06F *15/46*; G06K *9/00*

U.S. Cl. 382—8 **8 Claims**



1. A method of preparing a mask for serialization of chips on a wafer comprising:

initially forming a plurality of identical chip patterns on a mask by stepping and repeating a single chip pattern onto said mask in rows and columns, said single chip pattern having a blank area in said pattern; and

secondly forming location identifying indicia in the resulting blank areas of each chip pattern on the mask by stepping to each blank area after the formation of said chip patterns.

4,409,687

ARRANGEMENT AND METHOD FOR ESTABLISHING RADIO COMMUNICATION IN A SYSTEM

John C. Berti, and James W. Williams, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Continuation of Ser. No. 110,995, Jan. 10, 1980, abandoned, which is a continuation of Ser. No. 956,085, Oct. 30, 1978, abandoned. This application Apr. 14, 1981, Ser. No. 254,080

Int. Cl.³ H04Q *7/02*; H04B *7/26*

U.S. Cl. 455—7 **48 Claims**

1. An arrangement for establishing communication over one

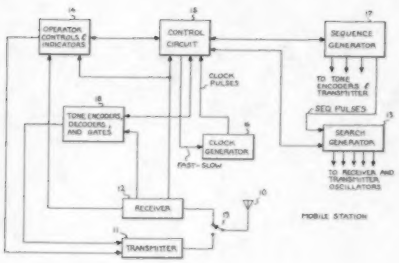
of a plurality of radio frequency channels between a first one of a plurality of radio stations and a second one of the plurality of radio stations through a repeater station, said arrangement comprising:

a. first means for placing said first station in an idle mode and for causing said first station to scan said radio frequency channels;

b. second means for stopping the scan caused by said first means in response to a predetermined group signal transmitted by said repeater on one of said channels, and enabling said first station to be operated on said one channel in response to said predetermined group signal thereon;

c. third means for alternatively placing said first station in a call originate mode and for causing said first station to scan said radio frequency channels; and

d. fourth means for stopping the scan caused by said third means on one of said channels and listening for a predetermined busy signal on said one channel and in response to the absence of said predetermined busy signal on said one channel, determining that said one channel is non-busy and enabling said first station to be operated on said non-busy channel in response to said absence of said predetermined busy signal thereon, and in response to the presence of said predetermined busy signal, continuing said scanning.



43. A method of automatically establishing trunked plural channel radio communication, between plural transceivers, said method comprising the following steps at each transceiver site:

normally scanning each channel to detect the presence of predetermined control signals thereon transmitted by another of said plural transceivers and, if detected, at least temporarily interrupting the scan and permitting transceive operations to occur, and

upon command, interrupting said normal scanning step to search for an idle one of said channels, and, when detected, thereafter generating and transmitting predetermined control signals thereon including the transmission of a busy signal interrupted during an initial listening period when an answering busy signal is detected to permit transceive communication operations.

4,409,688

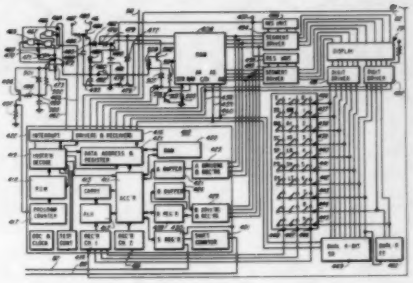
PROCESSOR CONTROLLED, SCANNING RADIO RECEIVER INCLUDING FUTURE CODE DEVELOPING MEANS

William Baker, Indianapolis, Ind., assignor to Masco Corporation of Indiana, Cumberland, Ind.

Continuation-in-part of Ser. No. 154,032, May 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 34,738, Apr. 30, 1979, Pat. No. 4,270,217. This application Jun. 28, 1982, Ser. No. 392,458

Int. Cl.³ H03J *7/18*

U.S. Cl. 455—165 **17 Claims**



1. In a scanning radio receiver, including frequency synthesizer means for generating a local oscillator signal for mixing with a received signal to produce an IF signal at a certain IF frequency, said frequency synthesizer means being digitally controlled and being responsive to applied frequency codes to develop a local oscillator frequency for reception of a signal at a frequency corresponding to the applied frequency code, a detector circuit for responding to said IF signal and including means for developing on a signal present line an indication of the receipt of a signal by the receiver, keyboard means for supplying control data, processor means coupled to said detector circuit through said signal present line and coupled to said frequency synthesizer means for control thereof, timer means operatively associated with said processor means, said processor means including means for testing for the presence or absence of a signal on said signal present line and further including a read only memory and a random access memory for storing data, the control data supplied by said keyboard means and the data stored by said read only and random access memory being such that frequencies to be scanned by said receiver are determinable therefrom, said processor means being operative to develop a frequency code for supply to said synthesizer means in accordance with said control and stored data, said random access memory having a first frequency code memory portion for temporarily containing a frequency code developed by said processor means, said processor means being controlled by said timer means to process said control and stored data to develop and supply a frequency code to said first frequency code memory portion and to thereafter output said frequency code from said first frequency code memory portion to said synthesizer means and to thereafter process control and stored data and develop and supply a new frequency code to said first frequency code, memory portion, said processor means being also controlled by said timer means for operating after supply of a new frequency code to said first frequency code memory portion to effect a test of said signal present line, and said processor means being responsive to the absence of a signal on said signal present line in said test thereof for output of said new frequency code from said first frequency code memory portion to said synthesizer means.

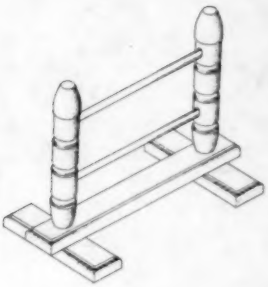
DESIGNS

OCTOBER 11, 1983

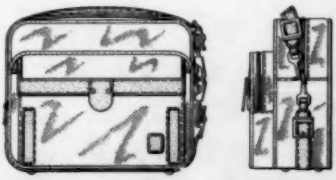
270,869
LADIES SPATS
Richard E. Kronberg, 1500 55th Ave. No., Minneapolis, Minn. 55430
Filed Jul. 13, 1981, Ser. No. 282,511
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—267

270,870
ATHLETIC SHOE
Harvey G. Tilles, P.O. Box 5466, 614 N. Hamilton, High Point, Guilford, N.C. 27262
Filed May 8, 1981, Ser. No. 261,889
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

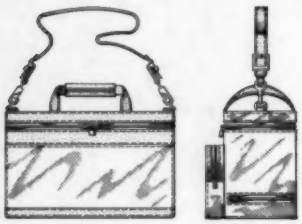
270,871
KNITTING STAND
Wendy M. Wright, 105 Balbair Rd., Kanata, Ontario, Canada K2L 1G5
Filed May 18, 1981, Ser. No. 264,988
Claims priority, application Canada, Feb. 23, 1981, 23-02-81-1
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D3—23



270,872
LUGGAGE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartman Luggage Company, Lebanon, Tenn.
Filed Feb. 12, 1982, Ser. No. 348,436
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

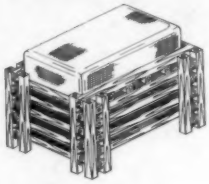


270,873
LUGGAGE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartman Luggage Company, Lebanon, Tenn.
Filed Feb. 12, 1982, Ser. No. 348,544
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



270,874
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,375
Claims priority, application Switzerland, Sep. 10, 1979, DMA/00007
The portion of the term of this patent subsequent to Sep. 13, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

270,875
OTTOMAN
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,803
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36

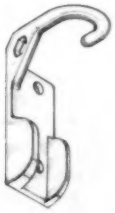


270,876
AUTOMOBILE SEAT
Yutaka Ikeda, Lomita, and Truman Pollard, Torrance, both of Calif., assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 10, 1981, Ser. No. 291,686
Claims priority, application Japan, Apr. 2, 1981, 56-14010
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

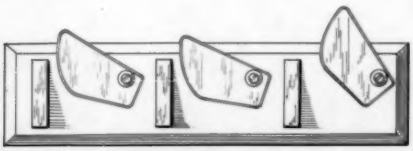
270,877
CHAIR
Larry G. Hickey, Costa Mesa, Calif., assignor to Tropitone Furniture Co., Inc., Sarasota, Fla.
Filed Dec. 23, 1980, Ser. No. 223,487
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

270,878
COLLAPSIBLE TOOTHBRUSH HOLDER
Ralph Sabatella, 711 Mound Ave., South Pasadena, Calif. 91030
Filed Apr. 13, 1981, Ser. No. 253,736
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—94

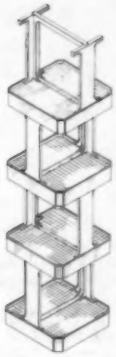
270,879
WALL MOUNTABLE BICYCLE SUPPORT
Jon O. Jacobson, 6836 - 20th NE., Seattle, Wash. 98115
Continuation-in-part of Ser. No. 61,033, Jul. 26, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,533
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—114



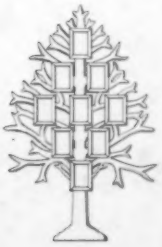
270,880
HOLDER FOR ROD SHAPED ARTICLES
Alpheus B. Poland, Rte. 5 Box 149, Coushatta, La. 71019
Filed Jul. 28, 1981, Ser. No. 287,778
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—125



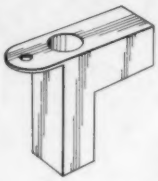
270,881
DIPLAY UNIT
Marvin Zaro, New York, N.Y., assignor to Advertising Displays Company, Englewood Cliffs, N.J.
Filed Jul. 1, 1980, Ser. No. 165,168
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—181



270,882
PICTURE FRAME
Arlie J. Wilson, Rte. #1, Box 268D, Tellico Plains, Tenn. 37385
Filed Jul. 15, 1981, Ser. No. 283,719
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

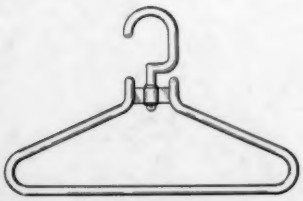


270,883
CORNER JUNCTION ELEMENT
Ake A. Hultberg, Stallarholmsvägen 2, S-150 30 Mariefred, Sweden
Filed Apr. 18, 1980, Ser. No. 142,064
Claims priority, application Sweden, Nov. 14, 1979, 79-2508
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246



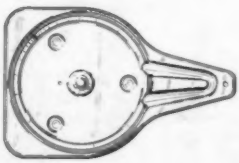
270,884
CLOTHES HANGER
Heikki Tavela, Helsinki, Finland, assignor to Oy Mk-Tuote AB, Helsinki, Finland
Filed Apr. 14, 1981, Ser. No. 234,178
Claims priority, application Finland, Dec. 29, 1980, 911/80
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247

270,885
CLOTHES HANGER
Auvo Taivalvuo, Sairakkala, Finland, assignor to Oy Mk-Tuote AB, Helsinki, Finland
Filed Apr. 14, 1981, Ser. No. 254,179
Claims priority, application Finland, Oct. 30, 1980, 789/80
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—256



270,886
DISH
John M. Wathen, Jr., Chester, N.J., assignor to James River-Dixie/Northern, Inc., Greenwich, Conn.
Division of Ser. No. 74,675, Sep. 12, 1979. This application Sep. 25, 1981, Ser. No. 305,788
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—28

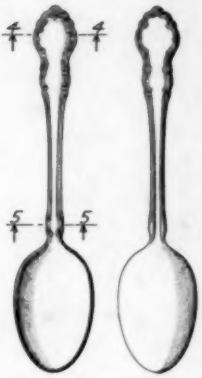
270,887
DISPOSABLE PAN FOR HEATING AND SERVING FOOD
David F. Allgeyer; Philip P. Johnson, both of Conway, and John W. Gilliom, Wooster, all of Ark., assignors to UMC Industries, Inc., Stamford, Conn.
Filed Mar. 5, 1981, Ser. No. 240,800
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—359



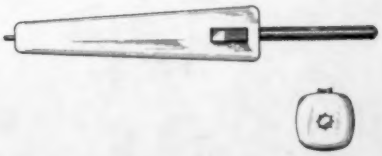
270,888
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,594
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

270,889
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,596
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

270,890
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 23, 1981, Ser. No. 314,378
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137



270,891
ELECTRIC SCALER AND PEELER
Chris T. Spurr, 1417 Avenue E, Bay City, Tex. 77414
Filed May 5, 1981, Ser. No. 260,556
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—139

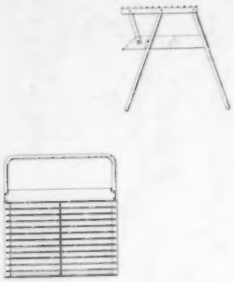


270,892

FOLDING COOKING GRILL

Omar Gonzales, 105 Willim Ave., San Antonio, Tex. 78209, and George B. Kobel, 4523 Briarwick, San Antonio, Tex. 78217

Filed Nov. 12, 1981, Ser. No. 320,657
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—336

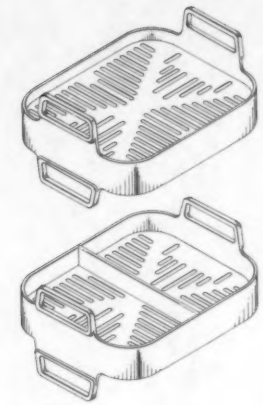


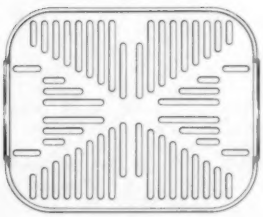
270,893

TRAY FOR MICROWAVE STEAMING UTENSIL

Robert F. Bowen, Burlington, Mass.; Walter B. Herbst, Evanston, and Thomas E. Salisbury, Highland Park, both of Ill., assignors to Raytheon Company, Lexington, Mass.

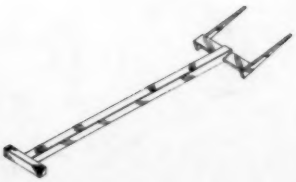
Filed Jun. 3, 1981, Ser. No. 270,045
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—409



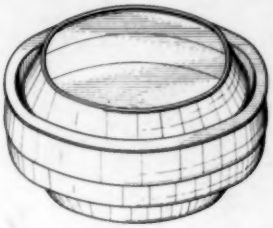


270,894
TREE GUARD
Robert E. Haggard, Everett, Wash., assignor to Merry Haggard, Snohomish, Wash.
Division of Ser. No. 158,937, Jun. 12, 1980, Pat. No. Des. 268,084. This application Sep. 9, 1982, Ser. No. 416,247
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—01

270,895
SHINGLE STRIPPER
William R. Holloway, 3046 Bloomington Ave. South, Minneapolis, Minn. 55407
Filed Jan. 22, 1981, Ser. No. 227,151
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—89

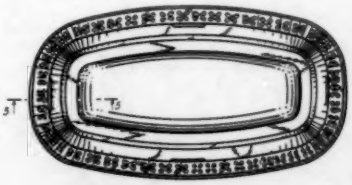


270,896
STORAGE CONTAINER FOR SMALL ARTICLES
Frederic Baillod, 1, Place du Tricentenaire, 2300 La Chaux-de-Fonds, Switzerland
Filed Feb. 27, 1981, Ser. No. 239,656
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—349

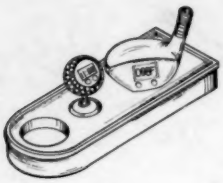


270,897
BOTTLE
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Nov. 5, 1980, Ser. No. 204,134
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—395

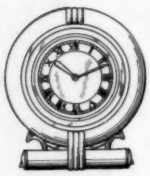
270,898
FOOD CONTAINER
Dennis J. Nemura, Easton, Pa., and John M. Wathen, Jr., Chester, N.J., assignors to James River-Dixie/Northern, Inc., Greenwich, Conn.
Division of Ser. No. 74,673, Sep. 12, 1979. This application Sep. 25, 1981, Ser. No. 305,789
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—429



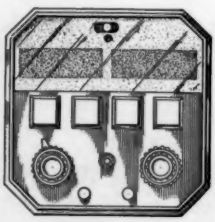
270,899
COMBINED CLOCK AND THERMOMETER DESK SET
Roger Huang, 2-6th Fl., 13 La. 118 Chung Ching S. Rd., Sec. 1, Taipei, Taiwan
Filed Sep. 14, 1981, Ser. No. 301,617
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



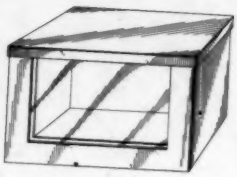
270,900
ALARM CLOCK
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Apr. 8, 1981, Ser. No. 252,223
Claims priority, application Hague, Oct. 16, 1980, 70774
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—23



270,901
FACE PLATE AND CONTROLS FOR AN AERONAUTICAL RADIO NAVIGATION DEVICE
George B. Foster, Worthington; Paul D. Gibbs, Blacklick, and Michael A. Smyser, Galena, all of Ohio, assignors to Foster Airdata Systems, Inc., Columbus, Ohio
Filed Dec. 17, 1980, Ser. No. 217,382
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—74



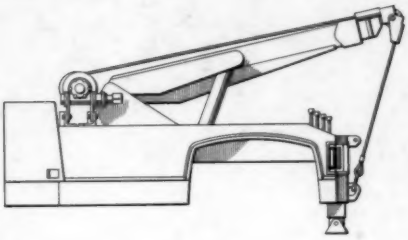
270,902
CHROMATOGRAPHY CHAMBER
Herman R. Felton, Wilmington, Del., assignor to Analtech, Incorporated, Newark, Del.
Filed Jun. 1, 1981, Ser. No. 269,414
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81



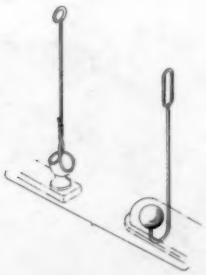
270,903
INFANT SCALE
Sönke Vogel, Hamburg, and Frohmut Müller, Barsbüttel, both of Fed. Rep. of Germany, assignors to Vogel & Halke, Fed. Rep. of Germany
Filed Jul. 16, 1980, Ser. No. 169,394
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1980, 66MR10919
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

270,904
MOUNTING FIXTURE FOR A MANNEQUIN HEAD
Louis V. Spina, 1211 E. Dominick St., Rome, N.Y. 13440
Filed Feb. 17, 1981, Ser. No. 234,663
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164

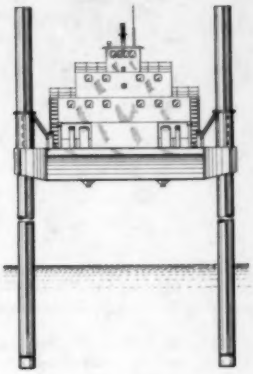
270,905
TOW TRUCK VEHICLE BODY
Ronald R. Nespor, c/o Chevron, Inc., R.D. #7, Rte. 62, Mercer, Pa. 16137
Filed Oct. 24, 1980, Ser. No. 200,076
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—14



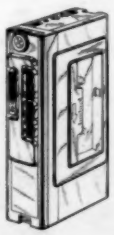
270,906
VISUAL AID UNIT FOR TRAILER HITCH ALIGNMENT
Jack Orr, 107 Lexington, Denton, Tex. 76201
Filed Jan. 5, 1981, Ser. No. 222,606
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



270,907
SELF-ELEVATING LINE TESTING VESSEL FOR OFFSHORE OIL LINES OR THE LIKE
David T. Younes, P.O. Box 7333, Abu Dhabi, United Arab Emirates
Filed Jul. 6, 1981, Ser. No. 280,283
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—316

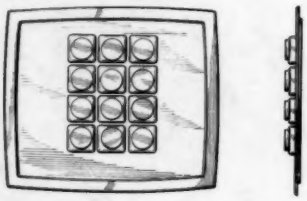


270,908
TAPE PLAYER
Kaoru Sumita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 6, 1981, Ser. No. 309,112
Claims priority, application Japan, Apr. 9, 1981, 56-15011
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

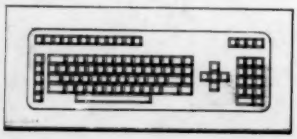


270,909
LOUDSPEAKER
Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 24, 1981, Ser. No. 246,959
Claims priority, application Japan, Nov. 8, 1980, 55-46725
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

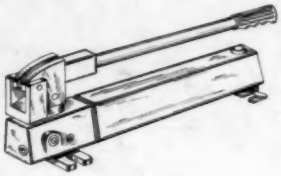
270,910
TELEPHONE COVER DEVICE
Milton Morse, Fort Lee, N.J., assignor to APM Corporation, Englewood, N.J.
Filed Feb. 23, 1981, Ser. No. 236,759
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66



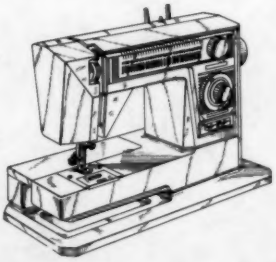
270,911
KEYBOARD
Evert Endt, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Jan. 21, 1981, Ser. No. 226,660
Claims priority, application Hague, Jul. 21, 1980, DM/000276
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100



270,912
HYDRAULIC PUMP
Donald W. Sessody, Brookfield, Wis., assignor to Applied Power Inc., Brookfield, Wis.
Filed Jun. 18, 1981, Ser. No. 275,138
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



270,913
SEWING MACHINE
Ziro Kosugi, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Continuation of Ser. No. 124,788, Feb. 25, 1980. This application Nov. 30, 1981, Ser. No. 325,829
Claims priority, application Japan, Sep. 19, 1979, 54 39,113
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69

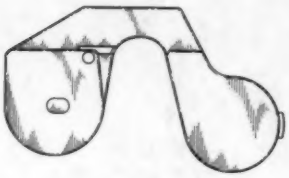


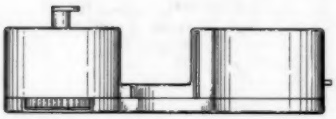
270,914

CARTRIDGE FOR PROTECTIVE FILM OVERLAY OF A RECORDING HEAD IN A XEROGRAPHIC PRINTER

Philip L. Nader, Succasunna, N.J., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 31, 1981, Ser. No. 290,273
Term of patent 14 years
Int. Cl. D16—*03, 99*
U.S. Cl. D16—32



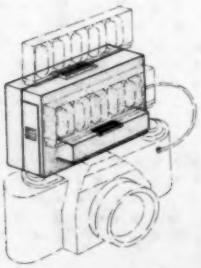


270,915

DUAL SOCKET FLASH ADAPTER FOR CAMERA

Timothy Fohl, Carlisle, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 19, 1981, Ser. No. 275,546
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

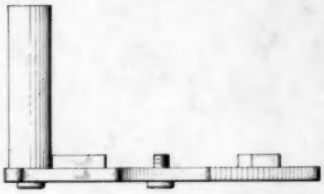


270,916

CAMERA GRIP

Nandor J. Cheplo, 4009 N. 30th St., Arlington, Va. 22207

Filed Oct. 19, 1981, Ser. No. 312,813
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—47



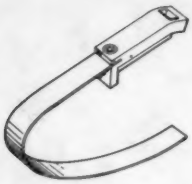
270,917

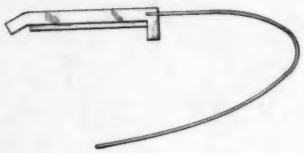
COMPACT PEDAL BOARD FOR ELECTRONICALLY-OPERATED MUSICAL INSTRUMENTS

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464; Patrick J. Bovenizer, Alsip, Ill.; Richard W. Jensen, Elmhurst, Ill., and William H. Hass, Hickory Hills, Ill., assignors to Richard H. Peterson, Palos Park, Ill.

Filed Jun. 9, 1981, Ser. No. 271,761
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—9

270,918
CAPO FOR A STRINGED MUSICAL INSTRUMENT
John Williamson, and Robert Falloon, both of Warnham, England, assignors to Muse Music Company Limited, England
Filed Dec. 4, 1980, Ser. No. 212,904
Claims priority, application United Kingdom, Jun. 6, 1980, 995201
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

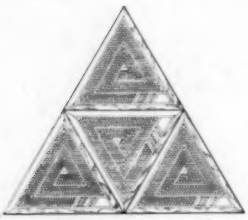




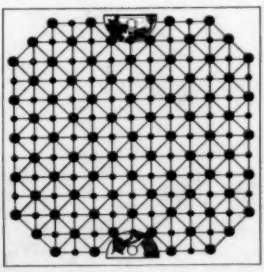
270,919
DRUM
George Migirian, 2832 E. Grand Blvd., Detroit, Mich. 48211
Filed May 28, 1981, Ser. No. 267,744
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

270,920
GAME TARGET
Donald F. Branom, P.O. Box 671, Oswego, Ill. 60543
Filed Jun. 1, 1981, Ser. No. 268,898
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—5

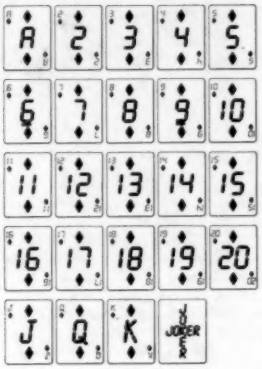
270,921
GAME BOARD
David Morgan, P.O. Sub 36, Saskatoon, Saskatchewan, Canada (S7H 3VO)
Filed Apr. 13, 1981, Ser. No. 253,889
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15



270,922
GAME BOARD
Bror O. Astergard, Nilssons Berg 3, Göteborg, Sweden (S-411 43)
Filed Mar. 5, 1981, Ser. No. 240,972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—31



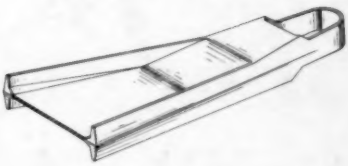
270,923
DECK OF PLAYING CARDS WITH SEGMENTED NUMBERS
Bill J. Raheb, 38 Briarwood Dr., Matawan, N.J. 07747
Filed Jul. 23, 1981, Ser. No. 286,299
The portion of the term of this patent subsequent to Jun. 21, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—45



270,924
TOY RAZOR
Ronald R. Klawitter, Gasconade County, Mo., assignor to Hand-i-Pac, Inc., Hermann, Mo.
Filed Apr. 17, 1978, Ser. No. 896,819
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122

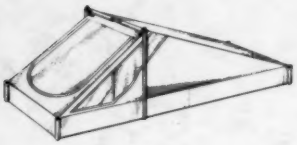
270,925
PHYSICAL EXERCISER
Senzo Watanabe, Nagoya, Japan, assignor to Kabushiki Kaisha Aiky Group, Nagoya, Japan
Filed Jul. 28, 1980, Ser. No. 173,197
Claims priority, application Japan, Jan. 29, 1980, 55-2367
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

270,926
SWIM FIN
John F. Simpson, 1622 Ponderosa Ave., Costa Mesa, Calif. 92626
Filed Aug. 28, 1981, Ser. No. 297,515
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—239



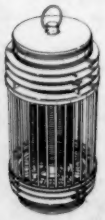
270,927
CHILD'S OUTDOOR PLAY GYM
Harold W. Carlson, Dothan, Ala., assignor to Brown Group Recreational Products, Inc., Bedford, Pa.
Division of Ser. No. 959,928, Nov. 13, 1978. This application Mar. 16, 1981, Ser. No. 243,818
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244

270,928
BACKPACKER'S TENT
Jean-Michel Brossier, 2081 Motor Ave., Los Angeles, Calif. 90064
Filed Jul. 9, 1981, Ser. No. 281,831
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253



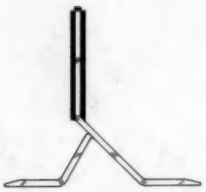
270,929
HANDGUN CASE
James F. Shasteen, Maumee, and Philip W. Shasteen, Defiance, both of Ohio, assignors to Shasteen Industries, Inc., Defiance, Ohio
Filed Jun. 12, 1981, Ser. No. 273,080
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

270,930
ELECTRONIC INSECT KILLER
Man H. Lee; Moon W. Lee; Ping N. Lin, and Kai C. Chan, all of 8/F, Sui On Industrial Bldg., 134 Wai Yip St., Kwun Tong, Kowloon, Hong Kong
Filed Dec. 7, 1981, Ser. No. 327,750
Claims priority, application United Kingdom, Jun. 16, 1981, 1000998
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

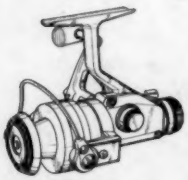


270,931
FISHING ROD HANDLE COMPONENT
Shigeru Yamamoto, Higashikurume, and Hideo Nakamura, Koganei, both of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 3, 1981, Ser. No. 289,645
Claims priority, application Japan, Feb. 9, 1981, 56-4695
Term of patent 14 years
Int. Cl. D24—*05*; D22—*23;26*
U.S. Cl. D22—23

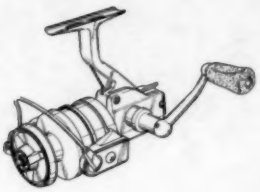
270,932
LINE GUIDE FOR FISHING ROD OR THE LIKE
Shigeru Yamamoto, Higashikurume, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Oct. 19, 1981, Ser. No. 312,396
Claims priority, application Japan, May 19, 1981, 56-21495
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24



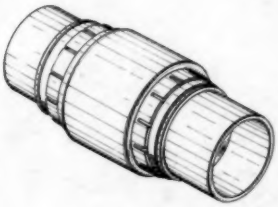
270,933
FISHING REEL
Kanji Iinuma, and Yasuhisa Kameda, both of Koganei, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jul. 30, 1981, Ser. No. 288,446
Claims priority, application Japan, Jan. 31, 1981, 56-3508
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



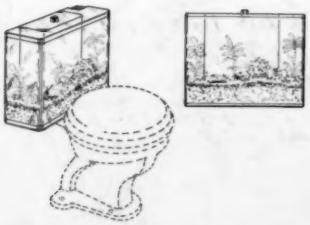
270,934
FISHING REEL
Kanji Iinuma, Koganei, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 19, 1981, Ser. No. 294,099
Claims priority, application Japan, May 29, 1981, 56-23667
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



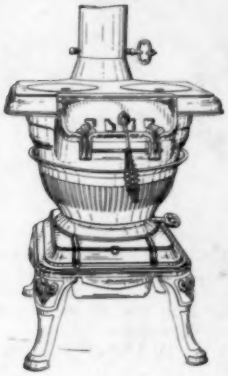
270,935
EXPANSION COUPLING FOR PLASTIC PIPE
Duane D. Logsdon, 1708 Calavera Dr., Fullerton, Calif. 92631
Filed Jan. 26, 1981, Ser. No. 228,299
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



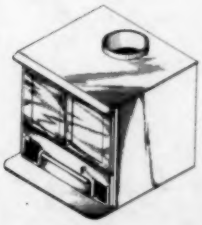
270,936
COMBINED TOILET TANK AND AQUARIUM
D. Randall Everson, 18615 Loree Ave., Cupertino, Calif. 95014
Filed Jan. 22, 1981, Ser. No. 227,164
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



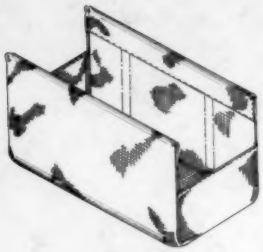
270,937
STOVE
Terence F. Porter, and Philip R. Allen, both of Auckland, New Zealand, assignors to Mason & Porter Limited, Mount Wellington, New Zealand
Filed Jan. 2, 1981, Ser. No. 222,517
Claims priority, application New Zealand, Sep. 25, 1980, 16753
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



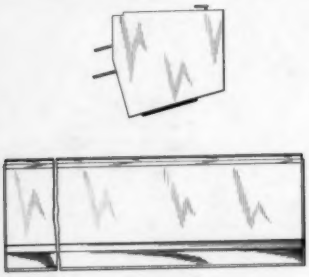
270,938
SOLID FUEL BURNING STOVE UNIT FOR USE AS FIREPLACE INSERT OR FREE-STANDING HEATER
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co. Inc., Harrisonburg, Va.
Filed Jun. 9, 1981, Ser. No. 272,018
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



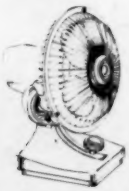
270,939
LOG HOLDER
Richard C. Stehlik, 1234 Hollins Rd., Waynesboro, Va. 22980
Filed Aug. 31, 1981, Ser. No. 297,978
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D23—138.5



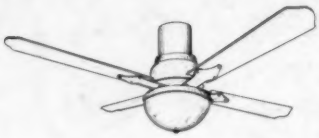
270,940
RIDGE CONSTRUCTION FOR A GREENHOUSE
Christopher Esposito, 897 Gardiner Dr., West Bay Shore, N.Y. 11706
Filed Jul. 6, 1981, Ser. No. 281,228
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D23—153



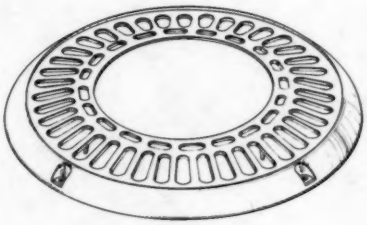
270,941
ELECTRIC DESK FAN
Chiang-Lee Lin, Rm. 5K, Chung Shan Commercial Bldg., No. 49, Chung Shan N. Rd., Sec. 3, Taipei, Taiwan
Filed Mar. 12, 1982, Ser. No. 357,796
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155



270,942
COMBINED CEILING FAN AND LIGHT
Lawrence G. McCain, Beverly Hills, Calif., assignor to Allware Agencies Limited, London, England
Filed Aug. 14, 1980, Ser. No. 178,021
Term of patent 14 years
Int. Cl. B23—*04*
U.S. Cl. D23—158



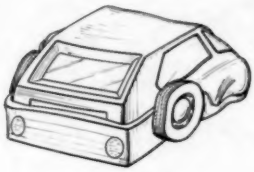
270,943
COVER PLATE FOR CEILING FANS
Warren E. Dennis, Pasadena, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Dec. 21, 1981, Ser. No. 332,744
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



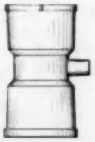
270,944
CANNULA MALE ADAPTOR PLUG EXTRACTOR
Van B. Hostetler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Mar. 18, 1981, Ser. No. 244,995
Term of patent 14 years
Int. Cl. D24—*03;* D8—*05*
U.S. Cl. D24—08

270,945
UTENSIL HOLDER FOR USE BY ARTHRITIC PATIENTS OR THE LIKE
Irving Kohn, P.O. Box 1112, Vallejo, Calif. 94590
Filed Apr. 17, 1981, Ser. No. 258,091
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—34

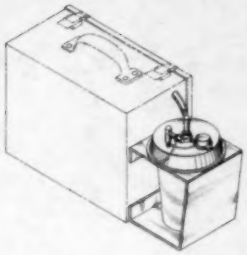
270,946
SIMULATIVE PACIFIER
Lisa Brauer, 5 Waldron St., Marblehead, Mass. 01945
Filed May 1, 1981, Ser. No. 259,512
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—45



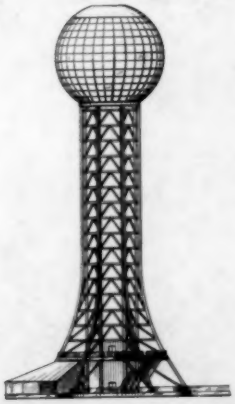
270,947
UNITARY, DISPOSABLE FILTER UNIT
Ravinder C. Mehra, Fairport; Heinz W. Hahn, Rochester, and Raj K. Aggarwal, Penfield, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Mar. 2, 1981, Ser. No. 239,321
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—57



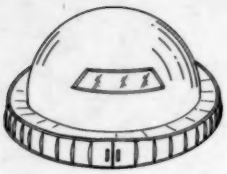
270,948
COMBINED COLLECTOR AND HOLDER FOR A PATIENT RESUSCIATION SUCTION PUMP
Sam L. Say, La Canada, Calif., assignor to S-Scor Corporation, La Canada, Calif.
Filed Apr. 10, 1981, Ser. No. 252,955
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—59



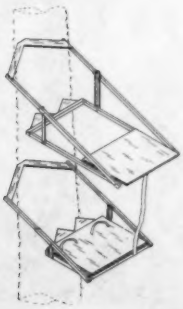
270,949
BUILDING STRUCTURE
William S. Denton, Jr., Morristown; Donald P. Shell, Knoxville, and Hubert Bebb, Gatlinburg, all of Tenn., assignors to Comunity Tectonics, Inc., Knoxville, Tenn.
Filed Aug. 24, 1981, Ser. No. 295,714
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—6



270,950
DISCOTEQUE BUILDING STRUCTURE
Diann D. Walls, Des Moines, Iowa 50312, and Sharon D. Newton, 1010 School St., Apt. 5, Des Moines, Iowa 50309, assignors to Sharon Newton, Des Moines, Iowa
Filed Aug. 27, 1981, Ser. No. 296,792
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—19



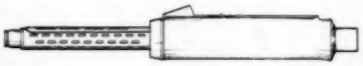
270,951
TREE STAND
Bobby G. Cryar, 115 Joann St., Albertville, Ala. 35950
Filed Apr. 10, 1981, Ser. No. 252,942
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—62



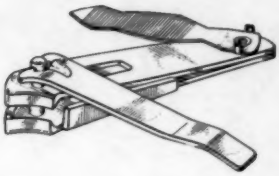
270,952
COMBINED LIGHTER HOLDER AND PIPE SMOKER'S TOOL
Charles A. Peterson, 444 Estudillo Ave., San Leandro, Calif. 94577
Filed Jan. 26, 1981, Ser. No. 228,384
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51

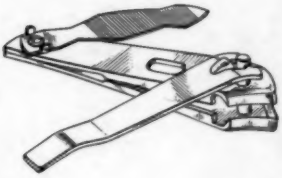
270,953
COMBINATION KNIFE AND PIPE TAMPER
Jerry Langtry, 24342 Penn, Dearborn, Mich. 48124
Filed Oct. 13, 1981, Ser. No. 310,757
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51

270,954
HAIR SETTING APPARATUS
Yoshio Mizobata, and Kunikaru Ichikawa, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Apr. 1, 1982, Ser. No. 364,442
Claims priority, application Japan, Oct. 19, 1981, 56-46607
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35

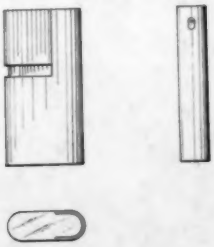


270,955
NAIL CLIPPER WITH CLIPPING EMPTYING CHAMBER
William B. Hannon, P.O. Box 187, Kihei, Maui, Hi. 96753
Filed Dec. 7, 1981, Ser. No. 327,959
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—60

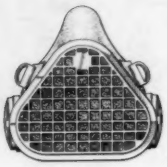


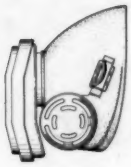


270,956
SPRAY
Carlos M. Martinez, Barcelona, Spain, assignor to Monturas y Fornituras, S.A., Barcelona, Spain
Filed Jul. 22, 1981, Ser. No. 285,773
Claims priority, application Spain, Feb. 14, 1981, 98,814
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—91.1



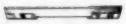
270,957
RESPIRATOR
Richard D. Maryyanek, Northbridge, and Joseph Z. Zdrok, Webster, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Nov. 8, 1982, Ser. No. 439,948
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D29—7





270,958
HORSESHOE
James J. Rigney, 158 Club Dr., Loveland, Ohio 45140
Filed Aug. 5, 1980, Ser. No. 175,663
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—35

270,959
HORSESHOE
James J. Rigney, 158 Club Dr., Loveland, Ohio 45140
Filed Aug. 5, 1980, Ser. No. 175,664
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—35



270,960
WET/DRY VACUUM CLEANER
Carl Parise, Reno, and Michael Parise, Sparks, both of Nev., assignors to Parise and Sons, Inc., Sparks, Nev.
Filed Apr. 28, 1981, Ser. No. 258,240
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21

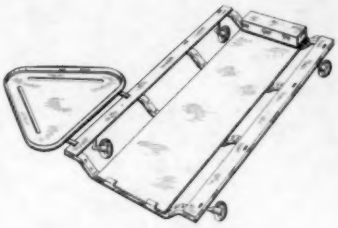
270,961
MOP BUCKET
Larry S. Hawkins, Winchester; William A. LaFollette, Jr., Stephens City, and Dale T. Maza, Stephenson, all of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Nov. 13, 1981, Ser. No. 321,043
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D32—53

270,962

COMBINED CREEPER AND TOOL CADDY

Detlef Martell, Kitchener, Canada, assignor to J. C. Hallman Manufacturing Co. Limited, Kitchener, Canada

Filed Oct. 22, 1981, Ser. No. 313,893
Claims priority, application Canada, Jul. 14, 1981, 14-07-81-6
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D34—23



270,963

STORAGE BASKET FOR FOOD PRODUCTS

Daniel D. Hawes, Chagrin Falls, and Edward W. Massey, Parma, both of Ohio, assignors to Bliss & Laughlin Industries Incorporated, Oak Brook, Ill.

Filed Mar. 16, 1981, Ser. No. 244,221
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—40

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TO WHOM

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Abe, Motoshi: *See*—
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Abrams, Simon. Ventilated rain garment. 4,408,356., Cl. 2-87.000.

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A'Costa, Anthony. Hand gun and kit therefor. 4,408,410., Cl. 42-90.000.

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Stelmack, Lawrence A., 4,408,825., Cl. 350-1.700.

Adamovich, Anatoly V.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.

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Rajendren, Richard B., 4,409,100., Cl. 210-219.000.

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Relyea, Richard D., 4,408,613., Cl. 128-670.000.

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Schirk, Gunter; and Kastl, Alfons, 4,408,891., Cl. 366-265.000.

Aggarwal, Sundar L.: *See*—
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,409,368., Cl. 525-314.000.

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Vora, Suresh M.; Mazzafro, William J.; Brian, Pierre L. T.; and Chen, Michael S. K., 4,409,064., Cl. 159-47.100.

Aisin Seiki Kabushiki Kaisha: *See*—
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Sakakibara, Shiro; Maseki, Shinobu; Watanabe, Kazuaki; and Minemoto, Isamu, 4,408,462., Cl. 60-330.000.

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Akai Electric Company Limited: *See*—
Watanabe, Hisashi; Urino, Yoshiteru; and Aotsu, Shinichi, 4,409,633., Cl. 360-127.000.

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Kitamoto, Tatsuji; and Akashi, Goro, 4,409,281., Cl. 428-212.000.

Akiba, Tokuji: *See*—
Minegishi, Keiichi; Akiba, Tokuji; Harada, Hiroshi; Takei, Akihiko; and Abe, Motoshi, 4,409,030., Cl. 106-97.000.

Akimov, Boris I.: *See*—
Azarevich, Gennady M.; Maximov, Jury V.; Akimov, Boris I.; and Gusyatsky, Iosif A., 4,408,472., Cl. 72-71.000.

Akimune, Yoshio; and Ambe, Satoshi, to Nissan Motor Company, Limited. Paste containing electrically conducting powder to form conducting solid filler in cavity in ceramic substrate. 4,409,135., Cl. 252-514.000.

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Akutsu, Fumihiko: *See*—
Takemura, Yasuhiko; and Akutsu, Fumihiko, 4,408,491., Cl. 73-626.000.

Akzona Incorporated: *See*—
Beijleveld, Wilhelmus M.; and van Drumpt, Jan D., 4,409,367., Cl. 525-277.000.
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Alcos Pharmaceuticals Limited: *See*—
Feurer, Bernard; and Baronet, Philippe, 4,409,258., Cl. 427-38.000.

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Alford, Sidney C., 4,408,535., Cl. 102-305.000.

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Ward, Brian L., 4,409,296., Cl. 428-610.000.

Allen, Paul E., to Logic Devices, Inc. Pneumatic method and apparatus for circulating liquids. 4,408,960., Cl. 417-54.000.

Allied Corporation: *See*—
Datta, Amitava; Davis, Lance A.; DeCristofaro, Nicholas J.; and Marti, Jordi, 4,409,041., Cl. 148-31.550.
Nienart, Louis F.; Fehrman, Richard G.; and Wan, Chung-Chu, 4,408,653., Cl. 164-463.000.
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Gossard, David C.; West. John; Stelson, Kim A.; Allison, Blair; Webb, R. Davis, Jr.; and Hardt, David, 4,408,471., Cl. 72-21.000.

Aloisio, Charles J., Jr.; Lenahan, Terrence A.; Smith, James V., Jr.; and Taylor, Carl R., to Western Electric Co., Inc.; and Bell Telephone Laboratories, Inc. Methods of and apparatus for coating lightguide fiber. 4,409,263., Cl. 427-163.000.

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Borrowman, S. Ralph; Altringer, Paulette B.; and Brooks, Parkman T., 4,409,189., Cl. 423-54.000.

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Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,409,036., Cl. 148-2.000.

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Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.

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Burger, Helga; and Rossmann, Christian, 4,409,119., Cl. 252-156.000.

Amemiya, Norio: *See*—
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American Hoechst Corporation: *See*—
Pollard, John K., Jr., 4,409,330., Cl. 435-178.000.

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Jirkovsky, Ivo L., 4,409,224., Cl. 424-251.000.

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Hanslik, Wilhelm, 4,408,888., Cl. 366-83.000.

American Seating Company: *See*—
Knapp, Robert L., 4,408,800., Cl. 297-285.000.

American Standard, Inc.: *See*—
Swiers, Richard H.; and Parkison, Richard G., 4,408,745., Cl. 251-357.000.

Ametek, Inc.: *See*—
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Heeger, Stephen E., 4,409,649., Cl. 364-144.000.

AMP Incorporated: *See*—
Apicelli, Samuel W.; and Grabbe, Dimitry G., 4,408,815., Cl. 339-95.00R.
Blades, Brian J., 4,409,450., Cl. 200-159.00B.
Eaby, Daniel G.; Long, William B.; and Shuey, John R., 4,408,820., Cl. 339-156.00R.
Forney, Edgar W., Jr., 4,408,821., Cl. 339-177.00R.

Huber, John H., 4,408,823., Cl. 339-208.000.
Kimmel, David J.; and Lauterbach, John H. F., 4,409,582., Cl. 337-231.000.
Weidler, Charles H., 4,408,824., Cl. 339-258.00R.
Werner, Walter M., 4,408,926., Cl. 403-310.000.

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Barzee, Verl N., 4,408,860., Cl. 354-293.000.

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Karpenko, Anatole N., 4,408,636., Cl. 138-94.000.

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Andersen, Steven C.; Penkauskas, Thomas P.; Kassel, James W.; and Newcomer, Stephen O., to Canada, Her Majesty the Queen, in right of, as represented by the Minister of National Defense. Serial data bus communication system. 4,409,656., Cl. 364-200.000.

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Anderson, Thomas E.: *See—*
Carney, Leroy L.; Loftin, Royal E.; Anderson, Thomas E.; and Vasquez, Guillermo, 4,409,108., Cl. 252-8.50C.

Anderson, Vernon B.: *See—*
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., 4,409,229., Cl. 424-267.000.

Andersson, Kjell; and Forsell, Ragnar, to Scandinavian Lancers Aktiebolag. Method and arrangement for spreading covering material. 4,408,750., Cl. 266-216.000.

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Prevedello, Aldo; Platone, Edoardo; and Morelli, Morello, 4,409,419., Cl. 585-611.000.

Anker, Charles A.: *See—*
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Mazelsky, Bernard, 4,408,738., Cl. 244-122.00R.

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Gordon, Harry W.; and Avila, Nanette R., 4,409,203., Cl. 424-61.000.

AVM Corporation: *See*—
Dodson, Daniel P.; and Ludwig, George C., 4,408,751., Cl. 267-120.000.

Axelgaard, Jens, to Professional Staff Association of the Rancho Los Amigos Hospital, Inc. Electrical muscle stimulation for treatment of scoliosis and other spinal deformities. 4,408,609., Cl. 128-421.000.

Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Battery system adapter for using film power packs. 4,409,644., Cl. 362-200.000.

Azarevich, Gennady M.; Maximov, Jury V.; Akimov, Boris I.; and Gusyatsky, Iosif A. Apparatus for the machining on cylindrical surfaces on metal-cutting lathes. 4,408,472., Cl. 72-71.000.

B. F. Goodrich Company, The: *See*—
Kim, Hueng T., 4,409,165., Cl. 264-53.000.

Baba, Fumio, to Fujitsu Limited. MOS Device including a substrate bias generating circuit. 4,409,496., Cl. 307-296.00R.

Baba, Fumio: *See*—
Takemae, Yoshihiro; and Baba, Fumio, 4,409,678., Cl. 365-206.000.

Bailey, Corey B.: *See*—
Axton, Hoyt W.; and Bailey, Corey B., 4,409,644., Cl. 362-200.000.

Baillievier, Freddy, to N.V. Bekaert S.A. Steel cord for reinforcement of elastomer material. 4,408,444., Cl. 57-237.000.

Baker, Lewin T., to General Electric Company. Building security, communication and control system. 4,409,590., Cl. 340-533.000.

Baker Perkins Holdings Limited: *See*—
Sutton, Leonard, 4,408,435., Cl. 53-225.000.

Baker Perkins Inc.: *See*—
Layfield, James D., 4,408,972., Cl. 425-8.000.

Baker, William, to Masco Corporation of Indiana. Processor controlled, scanning radio receiver including future code developing means. 4,409,688., Cl. 455-165.000.

Baldasarri, Giuseppe, to Southwire Company. Method of and apparatus for radiation pyrometric temperature measurement of a continuous cast metal bar. 4,408,903., Cl. 374-121.000.

Baldwin, A. Frank, to Burlington Industries, Inc. Process for dyeing absorbent microbiocidal fabric and product so produced. 4,408,996., Cl. 8-490.000.

Baliozian, Mardick. Multiple-effect light source, especially usable as a projector for photography, motion pictures and television or as a lighting apparatus. 4,409,646., Cl. 362-319.000.

Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F. Air and moisture resistant cover with electrical box having fastening flange. 4,408,695., Cl. 220-3.300.

Ballester, Jose F. Novel cover and container assembly. 4,408,698., Cl. 220-306.000.

Balliet, Richard F., to Clay, Andrew M., a part interest. Method and apparatus for increasing visual acuity. 4,408,846., Cl. 351-203.000.

Balliett, Robert W.: *See*—
Anderson, Mark A.; Balliett, Robert W.; Link, Paul E.; and Satchell, Donald P., 4,408,985., Cl. 432-1.000.

Bally Manufacturing Corporation: *See*—
Brey, Arthur L., 4,408,762., Cl. 273-121.00A.

Bankoku Needle Manufacturing Co., Ltd.: *See*—
Takahashi, Masamitsu, 4,408,691., Cl. 206-382.000.

Barclay, John A. Wheel-type magnetic refrigerator. 4,408,463., Cl. 62-3.000.

Baret, Jean-Luc A. G.; and Dohan, Luc A., to Corning Glass Works. Process for hydrolyzing lactose with immobilized lactose. 4,409,247., Cl. 426-41.000.

Barkan, Edward D.: *See*—
Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 4,409,470., Cl. 235-472.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Bauer, Karl; Dammann, Peter; Kubler, Hermann; and Lorenz, Hellmut, 4,408,448., Cl. 57-336.000.
Bauer, Karl; Schippers, Heinz; and Dammann, Peter, 4,408,449., Cl. 57-340.000.
Schippers, Heinz, 4,408,377., Cl. 28-250.000.

Baronet, Philippe: *See*—
Feurer, Bernard; and Baronet, Philippe, 4,409,258., Cl. 427-38.000.

Bartel, Donald L.: *See*—
Burstein, Albert H.; and Bartel, Donald L., 4,408,359., Cl. 3-1.912.

Barthelemy, Andre, to Automobiles Citroen; and Automobiles Peugeot. Rotary assistance device, more especially for vehicle steering. 4,409,503., Cl. 310-75.00D.

Barthelmess, Ulrich, to OMYA GmbH. Improved pivotable centrifugal classifier and method of classifying. 4,409,097., Cl. 209-11.000.

Bartholdsten, Dieter; Koop, Hermann; Schrode, Erhard; and Zielasek, Adelbert, to Polygram GmbH. Method for manufacturing disk-shaped information carriers. 4,409,169., Cl. 264-107.000.

Bartl, Knut; Lill, Helmut; Roeschlau, Peter; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Process and reagent for the determination of the biological activity of heparin in plasma. 4,409,327., Cl. 435-13.000.

Bartl, Knut: *See*—
Lill, Helmut; and Bartl, Knut, 4,409,334., Cl. 436-8.000.
Ziegenhorn, Joachim; Bartl, Knut; Roder, Albert; Lang, Gunter; Mollering, Hans; and Nagele, Ulrich, 4,409,328., Cl. 435-25.000.

Barton, C. D. Luggage identification tag. 4,408,406., Cl. 40-19.000.

Bartos, Ralph M. Lattice pie top cutter guide plate. 4,408,397., Cl. 33-174.00T.

Bartsch, Walter F., to Figgie International. Power brake for article feed apparatus. 4,408,687., Cl. 198-491.000.

Barzee, Verl N., to Ampex Corporation. Apparatus for a camera mount. 4,408,860., Cl. 354-293.000.

Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, to Ciba-Geigy Corporation. Novel phosphorylmuramyl peptides and processes for the manufacture thereof. 4,409,209., Cl. 424-177.000.

BASF Aktiengesellschaft: *See*—
Brandstetter, Franz; and Haaf, Franz, 4,409,363., Cl. 525-67.000.
Himmele, Walter; and Hoffmann, Werner, 4,409,402., Cl. 568-496.000.
Krabetz, Richard; Merger, Franz; and Schwarzmann, Matthias, 4,409,128., Cl. 502-211.000.
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,409,358., Cl. 524-547.000.

Basford, Robert; Hart, David; Hawkins, David; Knight, David; and Sidey, Roger, to Hugh Steeper Limited. Prosthesis. 4,409,529., Cl. 318-653.000.

Basset, Jean-Claude; and Meinguss, Alain, to Electronique Marcel Dassault. Transistor integrated device, particularly usable for coding purposes. 4,409,434., Cl. 178-22.190.

Bassoff, Arthur B., to Lear Siegler, Inc. Gear-roller. 4,408,473., Cl. 72-108.000.

Bastian, Gary T.: *See*—
Schnathorst, Vernon K.; and Bastian, Gary T., 4,409,680., Cl. 365-233.000.

Bates, Terence, to U.S. Philips Corporation. Deflection system for charged-particle beam. 4,409,486., Cl. 250-396.0ML.

Battles, James E.: *See*—
Mrazek, Franklin C.; and Battles, James E., 4,409,168., Cl. 264-104.000.

Bauer, Karl; Dammann, Peter; Kubler, Hermann; and Lorenz, Hellmut, to Barmag Barmer Maschinenfabrik AG. Yarn false twisting method and apparatus. 4,408,448., Cl. 57-336.000.

Bauer, Karl; Schippers, Heinz; and Dammann, Peter, to Barmag Barmer Maschinenfabrik AG. Friction false twisting apparatus. 4,408,449., Cl. 57-340.000.

Baugh, Hollis A. Latching system for control lines for pipe-laying barges. 4,408,929., Cl. 405-166.000.

Bayer Aktiengesellschaft: *See*—
Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., 4,409,421., Cl. 585-833.000.
Kohler, Armin; Schuster, Herbert; and Renner, Rudi, 4,409,187., Cl. 422-135.000.
Petruck, Gerd-Michael; and Wambach, Paul R., deceased, 4,409,407., Cl. 570-202.000.
Rottmaier, Ludwig; Merten, Rudolf; Tima, Milan J.; and Michael, Dietrich, 4,409,347., Cl. 524-91.000.
Wieczorrek, Wolfhart; and Mennicken, Gerhard, 4,409,266., Cl. 427-302.000.

Bazin, Alain, to Enertec. Electronic measuring device for a polyphase network, in particular for the measurement of power. 4,409,545., Cl. 324-107.000.

BBC Brown, Boveri & Company Limited: *See*—
Bruhwiler, Eduard; and Koch, Hans, 4,408,461., Cl. 60-737.000.
Jahnke, Bernd, 4,409,462., Cl. 219-121.0ED.

Bearden, Joe L.: *See*—
Clarady, Joseph F., Jr.; Jessee, Karen L.; and Bearden, Joe L., 4,408,881., Cl. 356-347.000.

Bearden, Roby, Jr.; and Stuntz, Gordon, to Exxon Research and Engineering Co. Process for reducing coke formation in heavy feed catalytic cracking. 4,409,093., Cl. 208-108.000.

Beauvais, Max P.; and Camezon, Raymond E. Microwave canning apparatus. 4,409,454., Cl. 219-10.55E.

Bechthold, Paul; Joswig, Franz; and Lingenbach, Josef, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Heatable cell for photoacoustic tests. 4,408,478., Cl. 73-24.000.

Bechtold, Stephen K. Skylight dome assembly. 4,408,422., Cl. 52-72.000.

Beck, Martin H.: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,409,161., Cl. 264-40.100.

Becker, James; and Neill, Daniel L., to Kelsey-Hayes Company. Digital odometer. 4,409,663., Cl. 364-561.000.

Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, to Siemens Aktiengesellschaft. Monitoring system for an LC filter circuit in an AC power network. 4,409,542., Cl. 324-57.00Q.

Beckerle, Heinz; Huster, Lothar; and Zondler, Rolf, to International Standard Electric Corporation. Method of making a dispersion lacquer for luminescent screens. 4,409,352., Cl. 524-405.000.

Beckham, Donald R.: *See*—
Ward, Robert S., Jr.; and Beckham, Donald R., 4,409,172., Cl. 264-209.200.

Beckman Instruments, Inc.: *See*—
Neeper, Robert K.; and Meyer, Richard C., 4,409,530., Cl. 318-685.000.

Beckmann, Charles H., to Du Pont de Nemours, E. I., and Company. Pigment pre-blending mixhead attachment. 4,408,890., Cl. 366-155.000.

Beckmann, Juergen: *See*—
Uhlig, Klaus; Szczurek, Marian; Vilacha, Carlos; and Beckmann, Juergen, 4,408,631., Cl. 137-380.000.
Beecham Group Limited: *See*—
Cantello, Barrie C. C., 4,409,216., Cl. 424-246.000.
Gasson, Brian C., 4,409,207., Cl. 424-114.000.
Hadley, Michael S., 4,409,225., Cl. 424-256.000.
Beelaard, Wilhelmus A. J.; and Vink, Nicolaas G., to U.S. Philips Corporation. Color display tube comprising a deflection yoke and deflection yoke for a color display tube. 4,409,578., Cl. 335-210.000.
Beiersdorf Aktiengesellschaft: *See*—
Cohnen, Erich, 4,409,232., Cl. 424-272.000.
Stenzel, Wolfgang; and Cohnen, Erich, 4,409,231., Cl. 424-272.000.
Beijbom, Peter: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,408,682., Cl. 188-202.000.
Beijleveld, Wilhelmus M.; and van Drumpt, Jan D., to Akzona Incorporated. Process for cross-linking polymers. 4,409,367., Cl. 525-277.000.
Belcher, Samuel L.; Peck, Timothy R.; and Smith, Roger D., to Cincinnati Milacron Inc. Dielectric heating section for blow molding machine. 4,409,455., Cl. 219-10.810.
Belgonucleaire: *See*—
Mergan, Leo M.; and Cordier, Jean-Pierre, 4,409,137., Cl. 252-632.000.
Bell, Clinton C. Flexographic ink distribution system. 4,408,527., Cl. 101-350.000.
Bell Telephone Laboratories, Inc.: *See*—
Aloisio, Charles J., Jr.; Lenahan, Terrence A.; Smith, James V., Jr.; and Taylor, Carl R., 4,409,263., Cl. 427-163.000.
Chandross, Edwin A.; and Hartless, Ray L., 4,409,318., Cl. 430-271.000.
Bellas, Michael; and Duvall, John, to Eastman Kodak Company. Preparation of imidazoles. 4,409,389., Cl. 548-342.000.
Belov, Alexei G.: *See*—
Zhuravlev, Vadim F.; and Belov, Alexei G., 4,408,482., Cl. 73-75.000.
Bendix Corporation, The: *See*—
Schacle, Charles V., 4,408,958., Cl. 416-237.000.
Benko, Pal; Bozsing, Daniel; Gundel, Jamos; and Magyar, Karoly, to Egyt Gyogyszervegyeszeti Gyar. Quinoxaline-1,4-dioxide fodder suppliments. 4,409,219., Cl. 424-250.000.
Bennett, Thomas H.: *See*—
Daniels, R. Gary; Bennett, Thomas H.; Musa, Fuad H.; and Wiles, Michael F., 4,409,671., Cl. 364-900.000.
Berger, Herbert: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,409,236., Cl. 424-275.000.
Berger, Siegfried: *See*—
Besocke, Karl-Heinz; and Berger, Siegfried, 4,409,509., Cl. 310-317.000.
Berglund, C. Neil: *See*—
Bohr, Mark T.; Yu, Kenneth K.; Chwang, Ronald J. C.; and Berglund, C. Neil, 4,409,259., Cl. 427-38.000.
Bernardis, Francesco, to Ing. C. Olivetti & C., S.p.A. Dot printing device for accounting, terminal, telewriting machine, and similar office machine. 4,408,907., Cl. 400-124.000.
Bernt, Jorgen O. Repair or replacement link. 4,408,450., Cl. 59-88.000.
Bertell, Jerome W., to Pennwalt Corporation. Synthetic hot forging lubricants and process. 4,409,113., Cl. 252-42.000.
Berth, Jorgen; Hansen, Erling; Heaven, Malcolm D.; and Petersen, Tommy, to Raychem A/S. Method of forming a wraparound closure article. 4,409,177., Cl. 264-531.000.
Berti, John C.; and Williams, James W., to General Electric Company. Arrangement and method for establishing radio communication in a system. 4,409,687., Cl. 455-7.000.
Besocke, Karl-Heinz; and Berger, Siegfried, to Kernforschungsanlage Julich GmbH. Piezoelectrically driven transducer for electron work function and contact potential measurements. 4,409,509., Cl. 310-317.000.
Betz Laboratories, Inc.: *See*—
Lichtner, Frederick W.; and Rose, Jean T., 4,409,192., Cl. 423-242.000.
Beukema, John A., to Grinnell Fire Protection Systems Company, Inc. Hingeable split pipe collar. 4,408,788., Cl. 285-419.000.
Beusse, Hans, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for landing loads from transport aircraft, especially low flying aircraft. 4,409,658., Cl. 364-424.000.
Bhatia, Shyam: *See*—
Mohan Rao, G. R.; Stanczak, John S.; Lien, Jih-chang; and Bhatia, Shyam, 4,408,385., Cl. 29-576.00B.
Bhattacharyya, Dhirendra N.; Seshan, Srinivasachari; Campbell, John S.; and Sen, Soumendranath, to Indian Explosives Limited. Water-in-oil emulsion explosives and a method for the preparation of the same. 4,409,044., Cl. 149-2.000.
BICC Public Limited Company: *See*—
Dey, Philip; Dunkley, Ronald; and Holden, Graham, 4,409,428., Cl. 174-43.000.
Bicker, Uwe: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,409,236., Cl. 424-275.000.
Bickford, Gary P.: *See*—
Fitzgerald, Robert W., Jr.; Hall, Robert L.; and Bickford, Gary P., 4,408,829., Cl. 350-96.290.
Bieri, Rudolf, to Rud. Biere Maschinen Und Apparatebau AG. Device for coating a surface of a conveyor band. 4,408,688., Cl. 198-500.000.
Biggs, Gary A.: *See*—
Karp, Arthur; and Biggs, Gary A., 4,409,518., Cl. 315-3.500.
Billig, Ernst; and Bryant, David R., to Union Carbide Corporation. Process for producing catalyst precursors. 4,409,149., Cl. 260-429.00R.
Bingham, George R.: *See*—
Lautensleger, Richard W.; Bingham, George R.; and Trepanier, Peter J., 4,408,423., Cl. 52-90.000.
Binz, Jorg: *See*—
Guth, Christian; and Binz, Jorg, 4,408,995., Cl. 8-477.000.
Bio-Rad Laboratories, Inc.: *See*—
Hanamoto, Mark S.; and Tanaka, Steve K., 4,409,335., Cl. 436-67.000.
Bird, Graham J.: *See*—
Serban, Alexander; Bird, Graham J.; and Cross, Lindsay E., 4,409,017., Cl. 71-94.000.
Birkelbach, Donald F.: *See*—
Shipley, Randall S.; and Birkelbach, Donald F., 4,409,126., Cl. 502-169.000.
Bissell, Eugene R.: *See*—
Smith, Robert E.; and Bissell, Eugene R., 4,409,140., Cl. 260-112.50R.
Bjorhaag, Georg, to Byggnads AB Hammaren. Method of preshaping a preformed lignocellulosic mat for molding into a structural member. 4,409,175., Cl. 264-517.000.
Bjurstrom, Lennart, to Aktiebolaget Bofors. Method and a device for increasing the linearity of a servo system. 4,409,531., Cl. 318-631.000.
Blackwood, John: *See*—
Mihovch, John; and Blackwood, John, 4,408,553., Cl. 112-158.00A.
Blades, Brian J., to AMP Incorporated. Double pole membrane switch having preferred sequence closing feature. 4,409,450., Cl. 200-159.00B.
Blake, Joseph W., III; and Kaufman, Jack W. Surgical device. 4,408,603., Cl. 128-325.000.
Blanchard, Clarence E., to Outboard Marine Corporation. Transom mounted marine propulsion device with fore and aft crankshaft and power shaft. 4,408,994., Cl. 440-53.000.
Block, Roger R. Connector for electromagnetic impulse suppression. 4,409,637., Cl. 361-119.000.
Bloom, Hanley D.; Bloom, Stanley; Perry, Fred E.; and Leone, Sam, to Architectural Signing, Inc. Panel sign. 4,408,407., Cl. 40-607.000.
Bloom, Stanley: *See*—
Bloom, Hanley D.; Bloom, Stanley; Perry, Fred E.; and Leone, Sam, 4,408,407., Cl. 40-607.000.
Bloomer, Charles K.: *See*—
Bustin, Franz; and Bloomer, Charles K., 4,408,970., Cl. 425-72.00R.
Blytas, George C., to Shell Oil Company. Removal of H_2S and COS. 4,409,199., Cl. 423-573.00G.
Board of Trustees operating Michigan State University: *See*—
Lehle, Fredric R.; Maine, James W.; Grossman, David; Leavitt, Richard A.; and Putnam, Alan R., 4,408,414., Cl. 47-1.00R.
Boehringer Ingelheim GmbH: *See*—
Stricker, Herbert, 4,409,206., Cl. 424-81.000.
Boehringer Mannheim GmbH: *See*—
Bartl, Knut; Lill, Helmut; Roeschlau, Peter; and Ziegenhorn, Joachim, 4,409,327., Cl. 435-13.000.
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,409,236., Cl. 424-275.000.
Lill, Helmut; and Bartl, Knut, 4,409,334., Cl. 436-8.000.
Ziegenhorn, Joachim; Bartl, Knut; Roder, Albert; Lang, Gunter; Mollering, Hans; and Nagele, Ulrich, 4,409,328., Cl. 435-25.000.
Boeing Company, The: *See*—
Buchsel, Christian K. E., 4,408,739., Cl. 244-137.00R.
BOGE GmbH: *See*—
Meller, Theo; and Knecht, Heinz, 4,408,773., Cl. 280-611.000.
Bohr, Mark T.; Yu, Kenneth K.; Chwang, Ronald J. C.; and Berglund, C. Neil, to Intel Corporation. MOS Dynamic RAM cell and method of fabrication. 4,409,259., Cl. 427-38.000.
Bollinger, John G.; Nichols, Richard E.; and Delaruelle, Dale H., to Harris Corporation. Engine monitoring system. 4,408,483., Cl. 73-115.000.
Bolmgren, Jan; Hoek, Bertil; and Nilsson, Kenth, to Siemens Aktiengesellschaft. Mosaic recorder with improved nozzle structure. 4,409,602., Cl. 346-140.00R.
Bolmgren, Jan: *See*—
Nilsson, Kenth; and Bolmgren, Jan, 4,409,601., Cl. 346-140.00R.
Boness, Kenneth D.: *See*—
Whitehead, Norman P.; Boness, Kenneth D.; and Martin, Roger, 4,409,617., Cl. 358-147.000.
Bonin, Jean-Claude, to CAV Rotodiesel. Fuel injection pump. 4,408,590., Cl. 123-502.000.
Bonnycastle, Joseph R.; Michaud, Alfred G.; and Rowley, Edward K., to C-I-L Inc. Explosive booster manufacture. 4,409,155., Cl. 264-3.00R.
Bononi, Walter H. Hinge joint for childrens eyeglasses. 4,408,843., Cl. 351-153.000.
Borchardt, John K.; and Brown, David L., to Halliburton Company. Enhanced oil displacement processes and compositions. 4,409,110., Cl. 252-8.55D.
Borden, Inc.: *See*—
Grace, Thomas T., Jr., 4,409,015., Cl. 71-28.000.
Williams, James H., 4,409,293., Cl. 428-524.000.
Borg-Warner Corporation: *See*—
Albertson, Clarence E.; Horwath, John A.; and Lashua, Duane W., 4,409,298., Cl. 428-614.000.

Borrowman, S. Ralph; Altringer, Paulette B.; and Brooks, Parkman T., to United States of America, Interior. Recovery of tungsten from brines. 4,409,189., Cl. 423-54.000.

Boscher, Georg; and Haeder, Wolfgang, to Siemens Aktiengesellschaft. Multiple joint box. 4,409,430., Cl. 174-92.000.

Bosco, Peter M.: *See—*
Danielson, Robert L.; and Bosco, Peter M., 4,409,255., Cl. 426-576.000.

Bose, Bimal K., to General Electric Company. Microcomputer-based pulse width modulated inverter fed machine drive system. 4,409,534., Cl. 318-811.000.

Bose, Sanjay K., to General Electric Company. Threshold-less collision detection and bit arbitration in a CFSK data system. 4,409,593., Cl. 340-825.500.

Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, to Boehringer Mannheim GmbH. N-Substituted aziridine-2-carboxylic acid derivatives and immuno-stimulation composition and method. 4,409,236., Cl. 424-275.000.

Bousquet, Jacques; Gueguen, Claude; and Vautier, Daniel. Process for improving the stability of catalysts for the catalytic hydrotreatment of petroleum cuts. 4,409,130., Cl. 502-211.000.

Bowden, William L., to Duracell Inc. Catalytic cathode for primary and secondary fluid cathode depolarized cells. 4,409,303., Cl. 429-105.000.

Bowman, James A., to Hoover Universal, Inc. Infinitely variable seat back recliner. 4,408,799., Cl. 297-361.000.

Boyesen, Eyvind, to Performance Industries, Inc. Motorcycle drive wheel suspension system. 4,408,674., Cl. 180-227.000.

Boyle, Donald E., Jr. Formable viscid caulking member and method of making same. 4,409,283., Cl. 428-272.000.

Bozik, John E.: *See—*
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,409,404., Cl. 568-902.000.

Bozsing, Daniel: *See—*
Benko, Pal; Bozsing, Daniel; Gundel, Jamos; and Magyar, Karoly, 4,409,219., Cl. 424-250.000.

Bradley, Gerald: *See—*
White, Alan C.; and Bradley, Gerald, 4,409,218., Cl. 424-248.550.

Bradley, Lindell P.: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,408,557., Cl. 116-206.000.

Bradley, Robert F.; and Bradley, Lindell P., to Micro-Circuits Co., Inc. Timer and storage condition indicator. 4,408,557., Cl. 116-206.000.

Brainman, Felix A.: *See—*
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.

Brandenstein, Manfred: *See—*
Walter, Lothar; Ernst, Horst M.; Brandenstein, Manfred; Kiener, Heinz; and Friedrich, Wolfgang, 4,408,809., Cl. 308-187.100.

Brandstetter, Franz; and Haaf, Franz, to BASF Aktiengesellschaft. Process for the manufacture of a mixture of polycarbonates and styrene-containing polymers, use of the mixture and molded parts thereof. 4,409,363., Cl. 525-67.000.

Brandt, Nils; and Einarsson, Torbjorn, to Asea Aktiebolag. Device for detecting faulty phases in a multi-phase electrical network. 4,409,636., Cl. 361-87.000.

Brasz, Albert J. H.; and Wallink, Hermanus A., to Stamicarbon, B.V. Process of making products consisting of foamed and/or cross-linked synthetic polymers. 4,409,164., Cl. 264-50.000.

Brauckmann, Wilhelm: *See—*
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,409,394., Cl. 549-534.000.

Brauer, Hans; and Demny, Werner, to Kocks Technik GmbH & Co. Rolling lines. 4,408,476., Cl. 72-229.000.

Braunschweigische Maschinenbauanstalt AG: *See—*
Schaper, Helmut, 4,409,031., Cl. 127-19.000.

Brester, Robert R.; and Roberts, Thomas L., to Velvac, Inc. Cutting tool having circular blade mounted on a pivoted lever. 4,408,508., Cl. 83-397.000.

Brewaeys, Luc; and Hens, Maurice, to CMP Chemical & Metallurgical Products Ltd. Blister pack. 4,408,693., Cl. 206-461.000.

Brey, Arthur L., to Bally Manufacturing Corporation. Electronic pinball game. 4,408,762., Cl. 273-121.00A.

Brian Griffin Pty. Limited: *See—*
Griffin, Brian C., 4,408,543., Cl. 108-24.000.

Brian, Pierre L. T.: *See—*
Vora, Suresh M.; Mazzafro, William J.; Brian, Pierre L. T.; and Chen, Michael S. K., 4,409,064., Cl. 159-47.100.

Bridgeport Tire Co. Ltd.: *See—*
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,409,457., Cl. 219-69.00M.

Bristol, James A.; and Lovey, Raymond G., to Schering Corporation. Imidazo[1,5-a]pyridines. 4,409,226., Cl. 424-256.000.

Bristol-Myers Company: *See—*
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,409,210., Cl. 424-177.000.

British Aerospace Public Limited Company: *See—*
Stevens, James W., 4,409,070., Cl. 204-4.000.

British Gas Corporation: *See—*
Masters, Jeffrey; Saimbi, Manjit S.; and Webb, Roger J., 4,408,983., Cl. 431-116.000.

British Steel Corporation: *See—*
Garner, Henry C.; Broadbent, Jack; Savidge, David H.; and Wadsworth, Eric, 4,409,549., Cl. 324-262.000.

Britt Tech Corporation: *See—*
Anderson, Donald R.; Norstrud, Iven R.; and Threlkeld, John H., 4,408,720., Cl. 239-149.000.

Broadbent, Edward G. Curtainsided vehicles. 4,408,793., Cl. 296-181.000.

Broadbent, Jack: *See—*
Garner, Henry C.; Broadbent, Jack; Savidge, David H.; and Wadsworth, Eric, 4,409,549., Cl. 324-262.000.

Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Process to produce anthracycline compounds. 4,409,391., Cl. 549-39.000.

Brock, Kenneth. Hand warmer. 4,408,355., Cl. 2-66.000.

Brodbeck, Robert M., to Marcamor, Inc. Telephone index and switch arrangement. 4,409,440., Cl. 179-90.0BD.

Brois, Stanley J.; Gutierrez, Antonio; and Ryer, Jack, to Exxon Research & Engineering Co. Hydrogen sulfide suppressant additive for functional fluids. 4,409,114., Cl. 252-75.000.

Brooke, Michael E.; and Wendt, Alan C., to United States Gypsum Company. Suspended panel ceiling having impact absorbent panel retaining clip assemblies. 4,408,428., Cl. 52-489.000.

Brooks, Alden W., to Dayco Corporation. Method of making a top toothed endless power transmission belt construction and a belt construction made by such method. 4,409,047., Cl. 156-138.000.

Brooks, Parkman T.: *See—*
Borrowman, S. Ralph; Altringer, Paulette B.; and Brooks, Parkman T., 4,409,189., Cl. 423-54.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Takiguchi, Michitaka; and Horie, Fujio, 4,408,554., Cl. 112-302.000.

Brower, Charles H.: *See—*
Wiley, John W.; Brower, Charles H.; and Wang, David, 4,409,280., Cl. 428-203.000.

Brown, David L.: *See—*
Borchardt, John K.; and Brown, David L., 4,409,110., Cl. 252-8.55D.

Brown, Paul, to Husky Injection Molding Systems Inc. Support for an intermediate platen of a stack mold. 4,408,981., Cl. 425-589.000.

Brown, Robert, to Rheological Systems, Inc. Apparatus and process for hot-stamping containers. 4,409,063., Cl. 156-542.000.

Brown, Robert J.; and Lever, Clyde J., Jr., to Western Electric Company, Inc. Telecommunications cable and method of making same. 4,408,443., Cl. 57-204.000.

Brown, Roy, to Graphoidal Developments Limited. Method and apparatus for glass mould lubrication. 4,409,010., Cl. 65-26.000.

Brown, Thomas W., to General Electric Company. Electrical circuit and method of operating such. 4,408,466., Cl. 62-208.000.

Brown, Timothy M.: *See—*
Hartman, Seymour; and Brown, Timothy M., 4,409,375., Cl. 525-505.000.

Broyles, Howard F.; White, Mark L.; and Dipprey, Neil F. Turret mounted solar concentrator with boom mounted secondary mirror or collector. 4,408,595., Cl. 126-424.000.

Bruce, William C., Jr., to Motorola, Inc. Method of performing a clear and wait operation with a single instruction. 4,409,653., Cl. 364-200.000.

Bruckner, Werner: *See—*
Schmalfeld, Jorg; Bruckner, Werner; Jacobs, Jorn; Greulich, H. S.; and Schlutter, A., 4,408,548., Cl. 110-347.000.

Bruhwiler, Eduard; and Koch, Hans, to BBC Brown, Boveri & Company Limited. Combustion chamber of a gas turbine with pre-mixing and pre-evaporation elements. 4,408,461., Cl. 60-737.000.

Brunswick Corporation: *See—*
Kent, Preben, 4,408,632., Cl. 137-516.290.
Kusche, David W., 4,408,579., Cl. 123-73.00V.
Moss, Elvis W.; and Shackelford, John T., 4,408,729., Cl. 242-84.50A.
Pittman, John B., 4,408,728., Cl. 242-84.20A.

Bryan, James S.; Gaster, Ivan; Tell, Mayo B.; and Dunn, Claude, to Dayco Corporation. Textile cot remover and method of making and using same. 4,408,395., Cl. 30-179.000.

Bryant, David R.: *See—*
Billig, Ernst; and Bryant, David R., 4,409,149., Cl. 260-429.00R.

Bucher-Guyer AG: *See—*
Vogt, Willy, 4,409,166., Cl. 264-72.000.

Buchsel, Christian K. E., to Boeing Company, The. Air transportable cargo loader for an airplane. 4,408,739., Cl. 244-137.00R.

Buhr, Gerhard; Ruckert, Hans; and Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive compounds, light-sensitive mixture, and light-sensitive copying material prepared therefrom. 4,409,314., Cl. 430-192.000.

Buljan, Sergej-Tomislav: *See—*
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,409,003., Cl. 51-295.000.
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,409,004., Cl. 51-295.000.

Bullseye Gun Centers, Inc.: *See—*
Reneau, J. R.; and Relyea, Richard D., 4,408,759., Cl. 272-131.000.

Bulten-Kanthal AB: *See—*
Camitz, Carl-Henning; and Lindgren, Stig, 4,408,747., Cl. 254-382.000.

Burger, Helga; and Rossmann, Christian, to Amchem Products, Inc. Process for regenerating cleaning solutions. 4,409,119., Cl. 252-156.000.

Burger, Joseph M., to Combustion Engineering, Inc. Pressurized core shroud for aligning a nuclear reactor core. 4,409,179., Cl. 376-302.000.

Burgert, Manfred. Feed-in device for continuous forms for a printer. 4,408,916., Cl. 400-613.200.

Burke, Billy T. Apparatus for separating a material of lighter specific gravity from a material of heavier specific gravity. 4,409,098., Cl. 209-172.500.

Burkhardt, Terry J.: *See*—
Langer, Arthur W., Jr.; Doyle, Gerald; Burkhardt, Terry J.; and Looney, Ralph W., 4,409,409., Cl. 585-255.000.

Burlington Industries, Inc.: *See*—
Baldwin, A. Frank, 4,408,996., Cl. 8-490.000.

Burov, Lev A.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.

Burroughs Corporation: *See*—
Woodward, Thomas R., 4,409,683., Cl. 370-112.000.

Burstein, Albert H.; and Bartel, Donald L., to New York Society for the Relief of the Ruptured and Crippled, Maintaining the Hospital for Special Surgery. Hip joint prosthesis. 4,408,359., Cl. 3-1.912.

Busch, Charles D., to Busch, Charles D. Method and apparatus for aerating bodies of water. 4,409,107., Cl. 210-758.000.

Busch, Norbert: *See*—
Combourieu, Michel; Laigle, Jean-Claude; and Busch, Norbert, 4,409,221., Cl. 424-250.000.

Buschkens, Guido; and Nobis, Peter, to Messer Griesheim GmbH. Procedure for packaging of food under protective gas in synthetic containers with flexible tops. 4,409,252., Cl. 426-396.000.

Busse, Charles E., to Maryland Cup Corporation. Method and apparatus for sealing the sidewall and bottom seam portions of two-piece containers during manufacture thereof. 4,409,045., Cl. 156-69.000.

Bustin, Franz; and Bloomer, Charles K., to Mobil Oil Corporation. Stabilizing air ring apparatus. 4,408,970., Cl. 425-72.00R.

Butler, John C.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Butler, L. Dennis; and Wells, J. Dwayne, to Sperry Corporation. Control linkage for two function bale pickup. 4,408,942., Cl. 414-24.500.

Buttner, Hans H. Machine for tying packages. 4,409,061., Cl. 156-502.000.

Byggnads AB Hammaren: *See*—
Bjorhaag, Georg, 4,409,175., Cl. 264-517.000.

Byrne, Dale M.: *See*—
Guthrie, Richard W.; and Byrne, Dale M., 4,408,827., Cl. 350-96.100.

Bzdula, Joseph A.; and Sibley, Howard W., to Carrier Corporation. Resin-oil shale composite reaction product. 4,409,362., Cl. 525-54.500.

C. H. Boehringer Sohn: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,409,235., Cl. 424-273.00R.

C-I-L Inc.: *See*—
Bonnycastle, Joseph R.; Michaud, Alfred G.; and Rowley, Edward K., 4,409,155., Cl. 264-3.00R.

C. L. Frost & Son, Inc.: *See*—
Redmann, Jerry L., Jr.; and Gurney, Gerald W., 4,408,808., Cl. 308-187.000.

Cabot Corporation: *See*—
Leon, Gonzalo S.; Fraize, John E.; and Fortier, Richard C., 4,409,171., Cl. 264-120.000.

Cadbury Schweppes PLC: *See*—
Jeans, Edward L., 4,408,701., Cl. 222-153.000.

Cahill, Lysle D.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Cairns, Hugh; Greenhalgh, Peter M.; and Howlett, Brian, to Fisons Limited. Pharmaceutical compositions containing sodium chromoglycate and $\beta 2$ selective bronchodilators. 4,409,237., Cl. 424-283.000.

Calkins Manufacturing Company: *See*—
Carrick, Lawrence K., 4,408,777., Cl. 280-461.00A.

Cambridge Instruments, Inc.: *See*—
Grossman, Hyman, 4,408,615., Cl. 128-696.000.

Cameco Industries, Inc.: *See*—
Willett, Harold A., 4,408,441., Cl. 56-14.300.

Camezon, Raymond E.: *See*—
Beauvais, Max P.; and Camezon, Raymond E., 4,409,454., Cl. 219-10.55E.

Camis, Thomas; Spencer, Paul R.; Schwiebert, Erwin H.; and Hay, Robert R., to Hewlett Packard Company. Corona discharge device for electrophotographic charging and potential leveling. 4,408,865., Cl. 355-3.0CH.

Camitz, Carl-Henning; and Lindgren, Stig, to Bulten-Kanthal AB. Device and method for collecting chains or the like. 4,408,747., Cl. 254-382.000.

Camm, Alan J.: *See*—
Spurrell, Roworth A. J.; Camm, Alan J.; and Ward, David E., 4,408,606., Cl. 128-419.0PG.

Campbell, Allan H.: *See*—
Richardson, Frank; and Campbell, Allan H., 4,408,811., Cl. 312-37.000.

Campbell, Ira J., to Westinghouse Electric Corp. Method for removing and replacing shrunk-on sleeves on a shaft. 4,408,382., Cl. 29-426.100.

Campbell, John S.: *See*—
Bhattacharyya, Dhirendra N.; Seshan, Srinivasachari; Campbell, John S.; and Sen, Soumendranath, 4,409,044., Cl. 149-2.000.

Campbell, Ronald J.: *See*—
Van Der Sande, Johannes H. M.; Sools, Franciscus G. P.; and Campbell, Ronald J., 4,409,517., Cl. 313-631.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Fortier, Michel, 4,408,537., Cl. 102-395.000.

Canada, Her Majesty the Queen, in right of, as represented by the Minister of National Defense: *See*—
Andersen, Steven C.; Penkauskas, Thomas P.; Kassel, James W.; and Newcomer, Stephen O., 4,409,656., Cl. 364-200.000.

Canon Kabushiki Kaisha: *See*—
Fukahori, Hidehiko; Iwashita, Tomonori; and Nakamura, Katsunori, 4,408,859., Cl. 354-274.000.
Horyu, Sakae, 4,409,437., Cl. 179-2.0DP.
Matsumoto, Kazuya, 4,409,631., Cl. 360-114.000.
Okano, Kazumi; Nishigaki, Yuji; and Kasai, Masanao, 4,409,310., Cl. 430-95.000.
Sugiura, Yoshinori, 4,408,559., Cl. 118-60.000.
Tomosada, Masahiro; and Maeshima, Katsuyoshi, 4,408,869., Cl. 355-14.00R.

Canon Kabuskiki Kaisha: *See*—
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,409,308., Cl. 430-60.000.

Cantello, Barrie C. C., to Beecham Group Limited. Method of treating diabetes using oxazoline or thiazoline compounds. 4,409,216., Cl. 424-246.000.

Caputo, Carmelo, to Solar 77 S.p.A. Hydraulic plant. 4,409,490., Cl. 290-4.00D.

Caratsch, Hans-Peter, to Sinter Limited. Apparatus for applying solder to printed circuit boards. 4,408,560., Cl. 118-69.000.

Cardenas, Luis F.; and Veazey, Enrique M., to Vitro Tec Fideicomiso. 90 Degree push-out for glassware forming machines and electronic control for the same. 4,409,013., Cl. 65-163.000.

Cargill Incorporated: *See*—
Moulson, Thomas J.; and Greenzweig, John E., 4,409,344., Cl. 523-512.000.

Carl, Norman J., to Sanders Associates, Inc. Scanning optical system. 4,409,477., Cl. 250-227.000.

Carle, Joseph T.: *See*—
Wilson, Brown L.; and Carle, Joseph T., 4,409,504., Cl. 310-87.000.

Carlton, Peter A.: *See*—
Childs, William H.; and Carlton, Peter A., 4,409,568., Cl. 333-156.000.

Carminati, Paolo: *See*—
Nisato, Dino; and Carminati, Paolo, 4,409,228., Cl. 424-267.000.

Carner, Marshall A.: *See*—
Torrey, Rodney J.; Astemborski, Dennis; Carner, Marshall A.; and Rose, Gerald D., 4,409,007., Cl. 55-112.000.

Carney, Leroy L.; Loftin, Royal E.; Anderson, Thomas E.; and Vasquez, Guillermo, to Halliburton Company. Lubricating composition for well fluids. 4,409,108., Cl. 252-8.50C.

Carrick, Lawrence K., to Calkins Manufacturing Company. Hitch mechanism. 4,408,777., Cl. 280-461.00A.

Carrier Corporation: *See*—
Bzdula, Joseph A.; and Sibley, Howard W., 4,409,362., Cl. 525-54.500.
Murnane, Raymond J.; Gomore, Stephen C.; and Mathewson, Myron, 4,408,467., Cl. 62-296.000.

Carter, Gordon V.; and Tromble, Ralph D., to General Electric Company. Trim strip assembly. 4,408,432., Cl. 52-718.000.

Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., to Carter Wind Power. Method of making blade supports. 4,409,050., Cl. 156-172.000.

Carter, J. Warne, Sr.: *See*—
Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., 4,409,050., Cl. 156-172.000.

Carter Wind Power: *See*—
Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., 4,409,050., Cl. 156-172.000.

Casio Computer Co., Ltd.: *See*—
Honjo, Yoshiaki, 4,409,467., Cl. 235-58.0CF.
Yasuda, Takeshi; and Watanabe, Kazuyoshi, 4,409,599., Cl. 346-76.0PH.
Yoshida, Junichi, 4,409,668., Cl. 364-745.000.

Catanese, Carmen A.: *See*—
Shefer, Joshua; and Catanese, Carmen A., 4,409,514., Cl. 313-449.000.

Caterpillar Tractor Co.: *See*—
Clairmont, Floyd H., Jr.; and Graze, Russell R., Jr., 4,408,575., Cl. 123-41.350.

CAV Rotodiesel: *See*—
Bonin, Jean-Claude, 4,408,590., Cl. 123-502.000.

Celanese Corporation: *See*—
Froix, Michael F.; and Kusumgar, Rajal M., 4,409,370., Cl. 525-414.000.

Central Plants, Inc.: *See*—
Tanner, Milton R., 4,409,102., Cl. 210-603.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Fischbach, Jean-Paul F., 4,408,878., Cl. 356-43.000.
Centre National d'Etudes Spatiales: *See*—
Le Stang, Jean-Claude; and Thomin, Georges, 4,409,493., Cl. 307-132.00R.
Cessna Aircraft Company, The: *See*—
Diel, Robert McK.; and Huebert, James P., 4,408,518., Cl. 91-31.000.
Chalesle, Andre: *See*—
Legros, Andre; and Chalesle, Andre, 4,408,785., Cl. 285-49.000.
Chambers, Allan K.: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,408,568., Cl. 122-379.000.
Champion International Corporation: *See*—
Hartman, Seymour; and Brown, Timothy M., 4,409,375., Cl. 525-505.000.
Chan, Riley T.: *See*—
Levenspiel, Octave; and Chan, Riley T., 4,408,656., Cl. 165-1.000.
Chandler Evans Inc: *See*—
Nasvytis, Pius J.; and Jahrstorfer, George W., 4,408,953., Cl. 415-62.000.
Chandler Evans, Inc.: *See*—
Laybourne, Bernard D., 4,408,961., Cl. 417-189.000.
Chandross, Edwin A.; and Hartless, Ray L., to Bell Telephone Laboratories, Incorporated. Photosensitive element containing a polymer of an indenone based compound and a methacrylate compound. 4,409,318., Cl. 430-271.000.
Chang, Pei-Ching: *See*—
Paszner, Laszlo; and Chang, Pei-Ching, 4,409,032., Cl. 127-37.000.
Chang, Tzu-Ching, to Du Pont de Nemours, E. I., and Company. Separation of 3,4-dichloroaniline. 4,409,386., Cl. 564-438.000.
Chaplin, Christopher R.; Gordon, James E.; and Jeronimidis, Giorgio, to Westvaco Corporation. Composite material. 4,409,274., Cl. 428-112.000.
Chapman, James S.; and Tedeschi, Anthony, to Western Electric Company, Inc. Holder for aligning paramagnetic articles. 4,408,753., Cl. 269-8.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Singer, Herbert B., 4,408,807., Cl. 308-187.000.
Chase, Thomas L.; and Ehemann, George M., Jr., to RCA Corporation. Photographic method for printing a viewing-screen structure using a light-transmission filter. 4,408,851., Cl. 354-1.000.
Chemische Werke Huls, AG: *See*—
Coenen, Alfred; Schroeder, Manfred; and Prominski, Guenter, 4,409,198., Cl. 423-462.000.
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,409,394., Cl. 549-534.000.
Chemplex Company: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,409,364., Cl. 525-74.000.
Chen, Michael S. K.: *See*—
Vora, Suresh M.; Mazzafro, William J.; Brian, Pierre L. T.; and Chen, Michael S. K., 4,409,064., Cl. 159-47.100.
Chen, Thomas Y.: *See*—
Ferguson, James M.; Chen, Thomas Y.; and Gibson, Walter G., 4,409,626., Cl. 358-338.000.
Cheng, Bao-ding, to Colgate Palmolive Company. Molecular sieve zeolite-built detergent paste. 4,409,136., Cl. 252-540.000.
Cherukuri, Subraman R.; Friello, Dominick R.; Hopkins, Walter; Parker, Ellery; and Mackay, Donald A. M., to Nabisco Brands, Inc. Chewing gum containing fructose syrup. 4,409,244., Cl. 426-5.000.
Chevron Research Company: *See*—
Hecker, William C., 4,409,123., Cl. 502-38.000.
Robinson, Richard C.; and Hecker, William C., 4,409,124., Cl. 502-5.000.
Van Leirsburg, Dean A., 4,409,190., Cl. 423-150.000.
Chew, Remedios K.: *See*—
Pastor, Ricardo C.; Chew, Remedios K.; and Gorre, Luisa E., 4,409,260., Cl. 427-82.000.
Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,409,217., Cl. 424-246.000.
Chichibu Cement Co., Ltd.: *See*—
Minegishi, Keiichi; Akiba, Tokuji; Harada, Hiroshi; Takei, Akihiko; and Abe, Motoshi, 4,409,030., Cl. 106-97.000.
Children's Medical Center Corporation, The: *See*—
Duffy, Frank H.; and Culver, Norman D., 4,408,616., Cl. 128-731.000.
Childs, William H.; and Carlton, Peter A., to Communications Satellite Corporation. Temperature compensated time delay element for a differentially coherent digital receiver. 4,409,568., Cl. 333-156.000.
Chimicasa GmbH: *See*—
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,409,245., Cl. 426-9.000.
Chirikjian, Jack G.: *See*—
Feller, William F.; Kantor, Judith A.; Chirikjian, Jack G.; and Phillips, Terence M., 4,409,200., Cl. 436-516.000.
Chisso Corporation: *See*—
Moteki, Tsutomu; Aoki, Kazuo; Yamaguchi, Kunihiro; and Yoshizaki, Michio, 4,409,345., Cl. 524-13.000.
Chittenden, Constance T.: *See*—
Weaver, Charles S.; and Chittenden, Constance T., 4,408,614., Cl. 128-680.000.
Chlorine Engineers Corp. Ltd.: *See*—
Yamaguchi, Kenzo; Ichisaka, Teruo; and Ikegami, Tadao, 4,409,084., Cl. 204-257.000.
Christian, Robert F., to Jude Engineering, Inc. Conveyor for removal of bed drain material from a coal-burning fluidized bed combustor. 4,408,944., Cl. 414-216.000.
Christianson, Charles: *See*—
Morris, Hayden; and Christianson, Charles, 4,409,485., Cl. 250-374.000.
Christie, Eugene J. Gas leak detector viewer. 4,408,480., Cl. 73-40.700.
Chugai Seiyaku Kabushiki Kaisha: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.
Tsuji, Yashuhiro; Wakabayashi, Kiyoshige; and Watanabe, Mitsuo, 4,408,880., Cl. 356-338.000.
Chwang, Ronald J. C.: *See*—
Bohr, Mark T.; Yu, Kenneth K.; Chwang, Ronald J. C.; and Berglund, C. Neil, 4,409,259., Cl. 427-38.000.
Ciba-Geigy AG: *See*—
Lenoir, John; and Jan, Gerald, 4,409,143., Cl. 260-205.000.
Ciba-Geigy Corporation: *See*—
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,409,209., Cl. 424-177.000.
Guth, Christian; and Binz, Jorg, 4,408,995., Cl. 8-477.000.
Mondadori, Cesare, 4,409,212., Cl. 424-244.000.
Rasberger, Michael, 4,409,346., Cl. 524-83.000.
Ciesiel, Allen R.; LaSpesa, Richard E.; and Zolavvar, Ruperto B., to Teletype Corporation. Printer ribbon cartridge mounting assembly. 4,408,914., Cl. 400-208.000.
Ciliberti, Frank L., Jr., to Duracell Inc. Method of jacketing a battery with a self-adhesive battery jacket and article. 4,409,051., Cl. 156-212.000.
Cincinnati Milacron Inc.: *See*—
Belcher, Samuel L.; Peck, Timothy R.; and Smith, Roger D., 4,409,455., Cl. 219-10.810.
Citizen Watch Company Limited: *See*—
Takasugi, Tsuneji; and Umezawa, Seiji, 4,408,900., Cl. 368-295.000.
Clairmont, Floyd H., Jr.; and Graze, Russell R., Jr., to Caterpillar Tractor Co. Nozzle assembly for controlled spray. 4,408,575., Cl. 123-41.350.
Clarady, Joseph F., Jr.; Jessee, Karen L.; and Bearden, Joe L., to United Technologies Corporation. Holographic inspection technique. 4,408,881., Cl. 356-347.000.
Clark Equipment Company: *See*—
Albright, Larry E.; and Hoechst, Lonnie D., 4,408,672., Cl. 180-89.140.
Clay, Andrew M.: *See*—
Balliet, Richard F., 4,408,846., Cl. 351-203.000.
Cleary, James D., to Unitek Corporation. Orthodontic palatal arch wires for accurate transmittal of correctional forces. 4,408,989., Cl. 433-7.000.
Clem, John R.; and Clem, John R. Superconducting magnetic shielding apparatus and method. 4,409,579., Cl. 335-216.000.
Clem, John R.: *See*—
Clem, John R.; and Clem, John R., 4,409,579., Cl. 335-216.000.
Clements, Alden K.: *See*—
Misencik, John J.; and Clements, Alden K., 4,409,574., Cl. 335-18.000.
Clevinger, Martin R. Dual signal magnetic pickup with even response of strings of different diameters. 4,408,513., Cl. 84-1.150.
CMP Chemical & Metallurgical Products Ltd.: *See*—
Brewaeys, Luc; and Hens, Maurice, 4,408,693., Cl. 206-461.000.
Coach and Car Equipment Corporation: *See*—
DeWitt, Robert W.; and Feddeler, Lester H., 4,408,743., Cl. 248-285.000.
Coad, Brian C., to GTE Products Corporation. Brazing compositions. 4,409,181., Cl. 420-502.000.
Coal Industry (Patents) Ltd.: *See*—
O'Brian, Rodney W., 4,409,096., Cl. 209-10.000.
Sampson, John D.; and Sparrow, David J. W., 4,408,886., Cl. 366-13.000.
Cobaris, Paul L.: *See*—
Green, James P.; and Cobaris, Paul L., 4,408,803., Cl. 301-5.700.
Cockerill Sambre: *See*—
Delcour, Leon J. E., 4,408,708., Cl. 228-139.000.
Coenen, Alfred; Schroeder, Manfred; and Prominski, Guenter, to Chemische Werke Huls, AG. Process for the production of copper (II) chloride from copper (II) oxychloride using tertiary amine hydrochlorides. 4,409,198., Cl. 423-462.000.
Cohen, Carlos; and Raab, Alfred, to Jacuzzi Inc. Fitting to combine air and pressurized water. 4,408,721., Cl. 239-417.000.
Cohnen, Erich, to Beiersdorf Aktiengesellschaft. Substituted oxadiazoles, method for the production thereof, compositions containing them and method of use thereof. 4,409,232., Cl. 424-272.000.
Cohnen, Erich: *See*—
Stenzel, Wolfgang; and Cohnen, Erich, 4,409,231., Cl. 424-272.000.
Colacino, James J.; and Leone, Ronald A., to International Business Machines Corporation. Electron beam exposed positive resist mask process. 4,409,319., Cl. 430-296.000.

Colapinto, Fabio, to Argon Industrie Meccaniche s.r.l. Method of and apparatus for drying freshly printed sheets and other substrates by infrared or ultraviolet radiation. 4,408,400., Cl. 34-4.000.
Colgate Palmolive Company: *See—*
Cheng, Bao-ding, 4,409,136., Cl. 252-540.000.
Colling, Edwin L., Jr.: *See—*
Slough, Carlton M.; and Colling, Edwin L., Jr., 4,409,553., Cl. 324-445.000.
Collington, Eric W.; Finch, Harry; Newton, Roger F.; and Wallis, Christopher J., to Glaxo Group Limited. Prostanoid compounds and pharmaceutical compositions. 4,409,213., Cl. 424-244.000.
Collins, Leonard D. Multi-storey building and a prefabricated panel for such a building. 4,408,434., Cl. 52-745.000.
Collonia, Harald: *See—*
Pfalzgraf, Manfred; Kern, Eckhart; and Collonia, Harald, 4,408,581., Cl. 123-339.000.
Colt Industries Operating Corp.: *See—*
Corrette, Richard H., 4,408,418., Cl. 51-288.000.
Comau S.p.A.: *See—*
Favareto, Marcello; and Anselmino, Renato, 4,409,464., Cl. 219-136.000.
Combes, Gilles; and Kuntz, Raymond, to Societe Anonyme dite: Alsthom-Atlantique. Apparatus for increasing the homogeneity of a fluid flow in a pipe. 4,408,892., Cl. 366-337.000.
Combourieu, Michel; Laigle, Jean-Claude; and Busch, Norbert, to Riom Laboratories - Cerm S.A. 1,2,3,4,4a,9b-Hexahydro-4a-piperazinylmethyl-4-dibenzofuranone or -dibenzofuranol derivatives. 4,409,221., Cl. 424-250.000.
Combustion Engineering, Inc.: *See—*
Burger, Joseph M., 4,409,179., Cl. 376-302.000.
Comerio Ercole, S.p.A.: *See—*
Comerio, Rinaldo I., 4,408,974., Cl. 425-194.000.
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Commeau, Alain, to Framatome. Method of manufacture of a hoop for the vessel of a nuclear reactor. 4,409,466., Cl. 219-137.00R.
Commonwealth of Australia, The: *See—*
Kossoff, George; and Robinson, David E., 4,408,492., Cl. 73-631.000.
Communications Satellite Corporation: *See—*
Childs, William H.; and Carlton, Peter A., 4,409,568., Cl. 333-156.000.
Compagnie Generale de Geophysique: *See—*
Gleize, Jacques; and Roy, Jean-Joseph, 4,408,677., Cl. 181-121.000.
Compagnie Generale des Etablissements Michelin: *See—*
Gerard, Francois; and Machat, Jean-Yves, 4,409,304., Cl. 429-158.000.
Computervision Corporation: *See—*
Zinky, William; and Rosenberg, Larry, 4,408,874., Cl. 355-52.000.
Condon, Edward L., to Merriam, Marshall & Bicknell. Graphic means and method for maximizing utilization of cargo space. 4,408,782., Cl. 283-70.000.
Conoco Inc.: *See—*
Davis, Richard L.; Graf, Harlan G.; and Edwards, Don L., 4,409,068., Cl. 202-85.000.
Jackson, Robert G.; and Yoon, Heeyoung, 4,408,571., Cl. 123-3.000.
Lafont, Larry J., 4,408,629., Cl. 137-329.040.
Yoon, Heeyoung; and Jackson, Robert G., 4,408,572., Cl. 123-3.000.
Consiglio Nazionale Delle Ricerche: *See—*
Assenza, Donello; and Pappalardo, Massimo, 4,409,510., Cl. 310-334.000.
Consonni, Pietro: *See—*
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, 4,409,388., Cl. 548-262.000.
Constantino, Louis L.: *See—*
Toy, Albert; Constantino, Louis L.; and Evans, Donald B., 4,409,174., Cl. 264-313.000.
Conti, Paolo. Rotary binder. 4,409,062., Cl. 156-518.000.
Continental Group, Inc., The: *See—*
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,409,161., Cl. 264-40.100.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Kuhn, Dieter; Rach, Heinz-Dieter; Frerichs, Udo; and Pieper, Henner, 4,408,647., Cl. 152-330.0RF.
Cook, E. Wayne. Multipurpose ratcheting wrench. 4,408,505., Cl. 81-98.000.
Cooper Laboratories, Inc.: *See—*
Shively, Charles D., 4,409,205., Cl. 424-78.000.
Copal Company Limited: *See—*
Suzuki, Akira; Yoshikawa, Yukio; and Kaneko, Katumi, 4,408,856., Cl. 354-234.000.
Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic rubber blends comprising crystalline polyolefin, vulcanized mono-olefin rubber and vulcanized nitrile rubber. 4,409,365., Cl. 525-78.000.
Cordea, James N.; and Sheth, Harshad V., to Armco Inc. Alloy steel for roll caster shell. 4,409,027., Cl. 75-128.00W.
Cordier, Jean-Pierre: *See—*
Mergan, Leo M.; and Cordier, Jean-Pierre, 4,409,137., Cl. 252-632.000.
Corning Glass Works: *See—*
Baret, Jean-Luc A. G.; and Dohan, Luc A., 4,409,247., Cl. 426-41.000.
Dumbaugh, William H., Jr., 4,409,337., Cl. 501-66.000.
Corrette, Richard H., to Colt Industries Operating Corp. Method of forming through-feed cylindrical thread rolling dies. 4,408,418., Cl. 51-288.000.
Cosyns, Jean; and Durand, Daniel, to Institut Francais du Petrole. Process for selectively hydrogenating a di-olefin in a mixture of hydrocarbons having at least 4 carbon atoms and comprising an α-olefin. 4,409,410., Cl. 585-259.000.
Couch, Robert D.; and Lenderking, Bruce N., to Westinghouse Electric Corp. Fiber optic system for measuring mechanical motion or vibration of a body. 4,408,495., Cl. 73-655.000.
Coulter Systems Corporation: *See—*
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.
Cousse, Henri: *See—*
Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, 4,409,241., Cl. 424-324.000.
Cowan, William S., to Armco Inc. Subsea template levelling system and method. 4,408,932., Cl. 405-227.000.
Coy, Donald L.; and McEvers, Dale L., to H & H Industries, Inc. Machine for precisely feeding and turning an axially movable non-rotating workpiece. 4,408,506., Cl. 82-20.000.
Crabtree, Joe: *See—*
Elmy, Raymond L.; and Crabtree, Joe, 4,408,683., Cl. 192-11.000.
Crane Co.: *See—*
Skarvada, Thomas, 4,409,664., Cl. 364-565.000.
Crawford, Wheeler C.: *See—*
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., 4,409,001., Cl. 44-71.000.
Cremonesi, Pietro; and Sportoletti, Giancarlo, to Italfarmaco S.p.A. Method for the preparation of calcium heparinate. 4,409,103., Cl. 210-638.000.
Crichlow, Charles A.: *See—*
Martin, Lawrence L.; Worm, Manfred; and Crichlow, Charles A., 4,409,145., Cl. 260-239.0BD.
Cross, Lindsay E.: *See—*
Serban, Alexander; Bird, Graham J.; and Cross, Lindsay E., 4,409,017., Cl. 71-94.000.
Crosson, William J., to Westmoreland Plastics Company. Removable electrical receptacle. 4,408,696., Cl. 220-3.600.
Crouch, Bill W.; Sauer, William F.; and Zylka, Kenneth R., to Meridian Industries, Inc. Method and apparatus for producing liquid impregnated fabric wipes. 4,408,437., Cl. 53-431.000.
CTS Corporation: *See—*
Kuo, Charles Y., 4,409,261., Cl. 427-96.000.
Cuisinarts, Inc.: *See—*
Podell, Allen F., 4,409,528., Cl. 318-345.00D.
Culver, Norman D.: *See—*
Duffy, Frank H.; and Culver, Norman D., 4,408,616., Cl. 128-731.000.
Cummins, William T.: *See—*
Leblanc, Raymond F.; and Cummins, William T., 4,408,931., Cl. 405-213.000.
Dahan, Pierre-Louis; and Letuan, Phac. Video system for assisting automobile traffic employing a segmented LCD display. 4,409,583., Cl. 340-22.000.
Dahle, Orvar; Hoffman, Bertil; Nordvall, Jan; Siby, Sture; and Widehn, Ake, to ASEA Aktiebolag. Pressure-sensing transducer. 4,408,496., Cl. 73-728.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Tano, Mikio, 4,408,487., Cl. 13-159.000.
Daikin Kogyo Co., Ltd.: *See—*
Namba, Mutsusuke; Suzue, Seisuke; Mizuno, Toshio; and Kataoka, Yoshiaki, 4,409,354., Cl. 524-431.000.
Dainippon Ink and Chemicals Inc.: *See—*
Tabayashi, Isao; Soma, Hiromi; and Fukutomi, Hiroshi, 4,409,040., Cl. 106-20.000.
D'Alessio, Michael S.; and Sandler, Stanley A., to Harsco Corporation. Shoring equipment. 4,408,431., Cl. 52-690.000.
D'Alessio, Michael S., to Harsco Corporation. Coupler. 4,408,922., Cl. 403-12.000.
Daly, Christopher N.; and Money, David K., to Telectronics Pty. Ltd. Implantable tissue-stimulating prosthesis. 4,408,608., Cl. 128-421.000.
D'Amato, Ralph J., to RCA Corporation. Electrode for an electron gun. 4,409,513., Cl. 313-348.000.
Dammann, Peter: *See—*
Bauer, Karl; Dammann, Peter; Kubler, Hermann; and Lorenz, Hellmut, 4,408,448., Cl. 57-336.000.
Bauer, Karl; Schippers, Heinz; and Dammann, Peter, 4,408,449., Cl. 57-340.000.
Damon Corporation: *See—*
Lim, Franklin, 4,409,331., Cl. 435-178.000.
Danfoss A/S: *See—*
Nielsen, Henrik B.; and Nygaard, Nils H., 4,409,524., Cl. 318-138.000.
D'Angelo, Charles: *See—*
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,409,004., Cl. 51-295.000.
Danhoff, Ronald S.: *See—*
Detterman, Don E.; Danhoff, Ronald S.; and Wheeler, William E., 4,408,780., Cl. 281-15.00R.
Daniels, Joseph C., to State Industries, Inc. Floor merchandise display container. 4,408,689., Cl. 206-45.170.

Daniels, R. Gary; Bennett, Thomas H.; Musa, Fuad H.; and Wiles, Michael F., to Motorola, Inc. Data processor having single clock pin. 4,409,671., Cl. 364-900.000.

Danielson, Robert L.; and Bosco, Peter M., to Nabisco Brands, Inc. Cold water soluble gelatin and process. 4,409,255., Cl. 426-576.000.

Danly Machine Corporation: *See*—
Schelli, William; and Sindelar, William E., 4,408,521., Cl. 100-229.00R.

Darnell, Robert D.; and Ingle, William M., to Motorola, Inc. Purification of silicon source materials. 4,409,195., Cl. 423-342.000.

Dart Industries Inc.: *See*—
Wolff, Martin J.; and Falvo, Joseph S., 4,408,919., Cl. 401-12.000.

Darwood, Phillip I.; Holland, Ernest; Taylor, Peter M.; and Marley, Christopher, to V. L. Churchill Limited. Wheel alignment gauge. 4,408,399., Cl. 33-203.180.

Data General Corporation: *See*—
Wallach, Steven; Holberger, Kenneth D.; Keating, David L.; and Staudaher, Steven M., 4,409,655., Cl. 364-200.000.

Data Packaging Corporation: *See*—
Yonkers, Edward, 4,408,912., Cl. 400-208.000.

Datta, Amitava; Davis, Lance A.; DeCristofaro, Nicholas J.; and Marti, Jordi, to Allied Corporation. Amorphous alloys for electromagnetic devices. 4,409,041., Cl. 148-31.550.

Davey, Richard G.: *See*—
Taylor, Randle W.; and Davey, Richard G., 4,409,014., Cl. 65-170.000.

Davis, Billy R.; and Davis, Bob G. Christmas tree stand. 4,408,415., Cl. 47-40.500.

Davis, Bob G.: *See*—
Davis, Billy R.; and Davis, Bob G., 4,408,415., Cl. 47-40.500.

Davis, Edward P. Leg aid device and method. 4,408,600., Cl. 128-80.00R.

Davis, George D.: *See*—
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,409,127., Cl. 502-205.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,409,133., Cl. 502-354.000.

Davis, Lance A.: *See*—
Datta, Amitava; Davis, Lance A.; DeCristofaro, Nicholas J.; and Marti, Jordi, 4,409,041., Cl. 148-31.550.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. Pharmaceutical compositions and methods employing 8-[3-(6-fluoro-1,2-benzisoxazol-3-yl)propyl]-1-phenyl-1,3,8-triazaspiro-[4.5]decan-4-one and derivatives thereof. 4,409,230., Cl. 424-267.000.

Davis, Richard L.; Graf, Harlan G.; and Edwards, Don L., to Conoco Inc. Injector for calciner. 4,409,068., Cl. 202-85.000.

Davis, William F., to Motorola, Inc. Output transient suppression circuit. 4,409,560., Cl. 330-296.000.

Davlantes, George N. Pet access door panel. 4,408,416., Cl. 49-168.000.

Day, David R.: *See*—
McElroy, Lucian G.; and Day, David R., 4,409,035., Cl. 134-6.000.

Dayco Corporation: *See*—
Brooks, Alden W., 4,409,047., Cl. 156-138.000.
Bryan, James S.; Gaster, Ivan; Tell, Mayo B.; and Dunn, Claude, 4,408,395., Cl. 30-179.000.

DBS, Inc.: *See*—
Senyitko, Erwin J., 4,408,523., Cl. 101-56.000.

DBX, Inc.: *See*—
Welland, David R., 4,409,500., Cl. 307-490.000.

Debuque, Ignacio D., Jr.: *See*—
Schlueter, William B.; and Debuque, Ignacio D., Jr., 4,408,573., Cl. 123-25.00P.

DeCamp, James E.; Arndt, Raymond J.; and Gruzewski, Ronald L., to Mactron, Inc. Apparatus for applying a coating to a moving surface. 4,408,562., Cl. 118-669.000.

DeCristofaro, Nicholas J.: *See*—
Datta, Amitava; Davis, Lance A.; DeCristofaro, Nicholas J.; and Marti, Jordi, 4,409,041., Cl. 148-31.550.

Decroix, Jean-Claude, to Societe Chimique des Charbonnages-CDF Chimie. Composite thermoplastic films and a process for their preparation. 4,409,286., Cl. 428-332.000.

Deepsea Ventures, Inc.: *See*—
Latimer, John P., 4,408,404., Cl. 37-58.000.

Deere & Company: *See*—
Lenski, Ralph; Peiler, Rolf W.; and Pauli, Klaus H., 4,408,947., Cl. 414-526.000.
Steilen, Ronald M., 4,408,704., Cl. 222-312.000.
Thompson, Raymond D., 4,408,744., Cl. 248-636.000.

Deffayet, Jean; and Lamarque, Etienne, to Thomson-Brandt. Launching mechanism for subcalibre projectile. 4,408,538., Cl. 102-522.000.

Deforeit, Christian J., to Matt. Hohner AG. Electronic musical instrument. 4,408,511., Cl. 84-1.010.

De Graaff, Hendrik C.: *See*—
Wagenaar, Kornelis J.; De Graaff, Hendrik C.; and Appels, Johannes A., 4,409,606., Cl. 357-13.000.

Degussa Aktiengesellschaft: *See*—
Krause, Helmfried; Wobbermin, Hubertus; and Geigle, Edgar, deceased, 4,409,185., Cl. 422-113.000.

Dehne, Clarence A., to Jervis B. Webb Company. Method and conveyor system for processing articles through successive operations. 4,408,540., Cl. 104-172.00B.

Deininger, Rolf: *See*—
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,409,245., Cl. 426-9.000.

Del Laboratories, Inc.: *See*—
Gordon, Harry W.; and Avila, Nanette R., 4,409,203., Cl. 424-61.000.

Delaruelle, Dale H.: *See*—
Bollinger, John G.; Nichols, Richard E.; and Delaruelle, Dale H., 4,408,483., Cl. 73-115.000.

Delayre, Jean L.: *See*—
Fossel, Eric T.; and Delayre, Jean L., 4,409,550., Cl. 324-300.000.

Delcour, Leon J. E., to Cockerill Sambre. Method of securing prefabricated lagging components to a metal surface, and a prefabricated lagging component for use in the method. 4,408,708., Cl. 228-139.000.

Deline, G. Duane, to McCormick & Company, Inc. Homogeneous, free-flowing liquid black pepper oleoresin composition. 4,409,257., Cl. 426-651.000.

Delta Electronic Manufacturing Corp.: *See*—
Nikitas, Nick C., 4,408,822., Cl. 339-177.00R.

Demny, Werner: *See*—
Brauer, Hans; and Demny, Werner, 4,408,476., Cl. 72-229.000.

Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, to Wacker-Chemie GmbH; and Hoechst Aktiengesellschaft, a part interest. Process for the manufacture of unsaturated carboxylic acid esters. 4,409,396., Cl. 560-245.000.

Dennison Manufacturing Company: *See*—
Fotland, Richard A., 4,409,604., Cl. 346-159.000.
Russell, David B., 4,408,979., Cl. 425-383.000.

DePaoli, Alan G.: *See*—
Richards, John S.; and DePaoli, Alan G., 4,409,621., Cl. 358-260.000.

Deprez, Michel; Fromion, Andre; Hardouin, Claude; and Vilas Boas, Jean C., to 501 Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Viewing system with automatic correction of the reading distance as a function of the inclination of the viewing screen housing. 4,408,835., Cl. 350-117.000.

Detterman, Don E.; Danhoff, Ronald S.; and Wheeler, William E., to R. R. Donnelley & Sons Company. Bound book and method of making such books. 4,408,780., Cl. 281-15.00R.

Deutsche Forschungs- und Versuchsanstalt fur Luft: *See*—
Kleber, Peter, 4,408,740., Cl. 244-158.00R.

Devaud, Genevieve. Compensated amorphous silicon solar cell. 4,409,424., Cl. 136-258.000.

Devine, Janet, to Sonobond Ultrasonics, Inc. Programmable power supply for ultrasonic applications. 4,409,659., Cl. 364-475.000.

Devine, Thomas M., Jr., to General Electric Company. Method of making titanium-stabilized ferritic stainless steel for preheater and reheater equipment applications. 4,408,709., Cl. 228-183.000.

DeWitt, Robert W.; and Feddeler, Lester H., to Coach and Car Equipment Corporation. Seat with wear-resistant mounting. 4,408,743., Cl. 248-285.000.

Dey, Philip; Dunkley, Ronald; and Holden, Graham, to BICC Public Limited Company. Overhead electric transmission systems. 4,409,428., Cl. 174-43.000.

Deyoe, Charles W.: *See*—
Johnson, Lawrence A.; Hoover, William J.; and Deyoe, Charles W., 4,409,256., Cl. 426-598.000.

Diamond Shamrock Corporation: *See*—
Angerer, Herman F.; and Tomov, Nenad R., 4,409,301., Cl. 429-27.000.

Dibble, Eric P.; and Lynch, Thomas E., to International Business Machines Corporation. Masking for selective electroplating jet method. 4,409,071., Cl. 204-15.000.

Diel, Robert McK.; and Huebert, James P., to Cessna Aircraft Company, The. Series self-leveling valve. 4,408,518., Cl. 91-31.000.

Diesel Kiki Co., Ltd.: *See*—
Nakamura, Hisashi, 4,408,591., Cl. 123-502.000.
Sutoh, Shinji; Hara, Toshizo; Harada, Takeshi; and Eda, Masahiro, 4,408,660., Cl. 165-21.000.
Takada, Haruhiko, 4,408,969., Cl. 418-93.000.

Dietrich, Herbert: *See*—
McAllister, Lawrence E.; and Dietrich, Herbert, 4,409,361., Cl. 524-876.000.

DiGiulio, Adolph V., to Atlantic Richfield Company. Process for forming fast-cool vinyl aromatic expandable polymers. 4,409,338., Cl. 521-59.000.

Di Marco, Bernard; and Kralik, Andrew J., to Siemens-Allis, Inc. Electromagnetically actuated anti-rebound latch. 4,409,573., Cl. 335-16.000.

DiNolfo, Mario A.: *See*—
Witzel, Frank; DiNolfo, Mario A.; Rodney, Burton; and Mackay, Donald A. M., 4,409,202., Cl. 424-49.000.

Dipprey, Neil F.: *See*—
Broyles, Howard F.; White, Mark L.; and Dipprey, Neil F., 4,408,595., Cl. 126-424.000.

Dobosh, Raymond M. Socket drive. 4,408,504., Cl. 81-59.100.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Hurnaus, Rudolf; Griss, Gerhart; Sauter, Robert; Grell, Wolfgang; Kobinger, Walter; and Pichler, Ludwig, 4,409,220., Cl. 424-250.000.

Dodson, Daniel P.; and Ludwig, George C., to AVM Corporation. Multi-chamber temperature compensated pneumatic counterbalance. 4,408,751., Cl. 267-120.000.

Doerr, John D.; and Duncan, Donn G. Device for treatment of barotrauma of the middle ear. 4,408,605., Cl. 128-402.000.

Dohan, Luc A.: *See*—
Baret, Jean-Luc A. G.; and Dohan, Luc A., 4,409,247., Cl. 426-41.000.

Dohmeier, Hans O. Laminated wearing plate assembly for tire chain. 4,408,645., Cl. 152-172.000.

Doi, Yoshinao: *See—*
Matsuda, Kazuo; Kohno, Mitsuo; and Doi, Yoshinao, 4,409,339., Cl. 521-143.000.

Dominguez, Manuel F.; and Ferguson, Joseph E., to Shell Oil Company. Tube hanger for steam generator. 4,408,570., Cl. 122-510.000.

Dommes, Werner: *See—*
Schaper, Siegfried; Wimmer, Anton; and Dommes, Werner, 4,408,380., Cl. 29-156.50A.

Donn Incorporated: *See—*
Zilch, Gregory W., 4,408,427., Cl. 52-481.000.

Doomernik B.V.: *See—*
Doomernik, Cornelis, 4,408,654., Cl. 165-10.000.

Doomernik, Cornelis, to Doomernik B.V. Accumulator for storing heat or cold. 4,408,654., Cl. 165-10.000.

Doree, Donald A. Thread conditioning device. 4,408,363., Cl. 10-1.00B.

Dorler, Jack A.; and Mosley, Joseph M., to International Business Machines Corporation. Transient controlled current switch. 4,409,498., Cl. 307-454.000.

Dornberger, Georg C. E.; and Streich, Robert E., to Western Electric Company, Inc. Method and apparatus for measuring the temperature of moving elongated articles and application thereof. 4,409,042., Cl. 148-129.000.

Dougan, Paul N., to Equity Oil Company. In situ recovery of oil and gas from water-flooded oil shale formations. 4,408,665., Cl. 166-266.000.

Dow Chemical Company, The: *See—*
Ham, George E., 4,409,349., Cl. 524-108.000.
Hefner, Robert E., Jr., 4,409,360., Cl. 524-804.000.
Hefner, Robert E., Jr., 4,409,371., Cl. 525-418.000.
Lyons, Charles E.; and Tung, Lu H., 4,409,369., Cl. 525-314.000.
Matthews, Donald P., 4,409,227., Cl. 424-263.000.
Shipley, Randall S.; and Birkelbach, Donald F., 4,409,126., Cl. 502-169.000.
Spangle, Lloyd B., 4,408,489., Cl. 73-432.00R.

Dow Mac Concrete Limited: *See—*
Parkins, Ian C. N. W., 4,409,159., Cl. 264-39.000.

Dowbenko, Rostyslaw; Hartman, Marvis E.; and Hockswender, Thomas R., to PPG Industries, Inc. Novel diluents useful in preparing high solids coating compositions. 4,409,376., Cl. 525-509.000.

Doyle, Gerald: *See—*
Langer, Arthur W., Jr.; Doyle, Gerald; Burkhardt, Terry J.; and Looney, Ralph W., 4,409,409., Cl. 585-255.000.

Dravo Corporation: *See—*
Oyler, John F., 4,408,987., Cl. 432-137.000.

Dresser Industries, Inc.: *See—*
Adelmann, William J., Jr., 4,408,765., Cl. 277-3.000.
Jones, Thaddeus M., 4,409,540., Cl. 323-369.000.
Urmy, Charles W., Jr., 4,409,112., Cl. 252-33.400.

Dropczynski, Hartmut, to Jagenberg Werke AG. Method and apparatus for the automatic severing and reattachment of a web. 4,408,727., Cl. 242-56.00R.

Drutchas, Gilbert H., to TRW Inc. Power steering pump. 4,408,963., Cl. 417-283.000.

Duffy, Frank H.; and Culver, Norman D., to Children's Medical Center Corporation, The. Brain electricaL activity mapping. 4,408,616., Cl. 128-731.000.

Duke, Ronald J.: *See—*
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Dumbaugh, William H., Jr., to Corning Glass Works. Glass envelopes for tungsten-halogen lamps. 4,409,337., Cl. 501-66.000.

Dummer, Gerhard: *See—*
Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, 4,409,396., Cl. 560-245.000.

Duncan, Donn G.: *See—*
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Dunkley, Ronald: *See—*
Dey, Philip; Dunkley, Ronald; and Holden, Graham, 4,409,428., Cl. 174-43.000.

Dunn, Claude: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Beckmann, Charles H., 4,408,890., Cl. 366-155.000.
Chang, Tzu-Ching, 4,409,386., Cl. 564-438.000.
Kolouch, Robert J.; and Michel, Rudolph H., 4,409,167., Cl. 264-102.000.
Lindsey, William B., 4,409,384., Cl. 536-60.000.
Seidel, William C.; and Staikos, Dimitri N., 4,409,076., Cl. 204-130.000.
Sondergeld, Manfred A. J., 4,409,115., Cl. 252-79.100.
Squire, Edward N., 4,409,393., Cl. 549-448.000.

Duracell Inc.: *See—*
Bowden, William L., 4,409,303., Cl. 429-105.000.
Ciliberti, Frank L., Jr., 4,409,051., Cl. 156-212.000.

Durand, Daniel: *See—*
Cosyns, Jean; and Durand, Daniel, 4,409,410., Cl. 585-259.000.

Duro-Test Corporation: *See—*
Walsh, Peter, 4,409,512., Cl. 313-113.000.

Durrer, Jorg: *See—*
Mayer, Cornelius; Durrer, Jorg; and Weber, Ronald, 4,409,468., Cl. 235-404.000.

Duruz, Louis; and Strehl, Jean-Marc, to Raskin, S.A. Machine for cutting sheet material. 4,409,463., Cl. 219-121.0LG.

Duvall, John: *See—*
Bellas, Michael; and Duvall, John, 4,409,389., Cl. 548-342.000.

Eaby, Daniel G.; Long, William B.; and Shuey, John R., to AMP Incorporated. Electrical terminals for modular wiring systems. 4,408,820., Cl. 339-156.00R.

Earle, John L. Windmill yaw and speed controls. 4,408,954., Cl. 416-9.000.

Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., to Thermacore, Inc. Cabinet cooler heat exchanger. 4,408,661., Cl. 165-164.000.

Eastman Kodak Company: *See—*
Armour, Eugene A.; Henzel, Richard P.; and Mowrey, Rowland G., 4,409,315., Cl. 430-214.000.
Bellas, Michael; and Duvall, John, 4,409,389., Cl. 548-342.000.
Frank, Lee F., 4,408,857., Cl. 354-234.000.
Gustafson, Gary B., 4,408,866., Cl. 355-3.0TR.
Lee, James K., 4,408,858., Cl. 354-234.000.
Lelental, Mark; Rasch, Arthur A.; and Sullivan, David P., 4,409,307., Cl. 430-31.000.
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Mutrux, Claude, 4,408,897., Cl. 368-200.000.

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Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., 4,409,421., Cl. 585-833.000.

Eckert, Herbert L.: *See—*
Marsch, James E.; and Eckert, Herbert L., 4,408,746., Cl. 254-344.000.

Eda, Masahiro: *See—*
Sutoh, Shinji; Hara, Toshizo; Harada, Takeshi; and Eda, Masahiro, 4,408,660., Cl. 165-21.000.

Edel, Hans J.; and Hornung, Helmut. Elevated swivel chair having a movable foot support for locking the chair against swiveling motion. 4,408,801., Cl. 297-433.000.

Edlong Corporation, The: *See—*
Johnson, Lawrence A.; Hoover, William J.; and Deyoe, Charles W., 4,409,256., Cl. 426-598.000.

Edson, Douglas M., to Sprague Electric Company. Offset lead configuration for solid electrolyte capacitor. 4,409,642., Cl. 361-433.000.

Edwards, Don L.: *See—*
Davis, Richard L.; Graf, Harlan G.; and Edwards, Don L., 4,409,068., Cl. 202-85.000.

Edwards, Roy E.; and Price, Anthony G., to Lucas Industries Limited. Control valve assemblies for hydraulic braking systems. 4,408,805., Cl. 303-6.00A.

Edwards, William R.: *See—*
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Benko, Pal; Bozsing, Daniel; Gundel, Jamos; and Magyar, Karoly, 4,409,219., Cl. 424-250.000.

Ehemann, George M., Jr.: *See—*
Chase, Thomas L.; and Ehemann, George M., Jr., 4,408,851., Cl. 354-1.000.

Ehrenkranz, Joel R. L. Urinary temperature measurement device. 4,408,905., Cl. 374-157.000.

Eichler, Helmut; Vorhagen, Friedrich W.; and Hutten, Hans M. Method for the reproduction of originals which, with respect to their color content, are scanned according to a tristimulus method. 4,409,614., Cl. 358-76.000.

Eickerman, Curtis L.; and Ramsey, Arlie A., to Motorola Inc. Power-on reset circuit. 4,409,501., Cl. 307-594.000.

Einarsson, Torbjorn: *See—*
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EKA AB: *See—*
Holmberg, Krister; and Nilsson, Ingvar, 4,409,117., Cl. 252-99.000.

Ekstrom, James R. Wave powered turbine. 4,408,965., Cl. 417-331.000.

Elder, Melisse N.: *See—*
Morrison, Lowen R., Jr.; Elder, Melisse N.; and Phillips, John H., 4,409,253., Cl. 426-424.000.

Electronique Marcel Dassault: *See—*
Basset, Jean-Claude; and Meinguss, Alain, 4,409,434., Cl. 178-22.190.
Geesen, Michel, 4,408,895., Cl. 368-118.000.

Ellen, Leonard W. Pipe organ. 4,408,517., Cl. 84-345.000.

Elliott, William J., to Quietlite International, Inc. Direct current power source for an electric discharge lamp using reduced starting current. 4,409,522., Cl. 315-308.000.

Ellis, Wayne S. Transplanting implement. 4,408,550., Cl. 111-2.000.

Elm, Rainer: *See—*
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,409,394., Cl. 549-534.000.

Elmer, Otto C., to General Tire & Rubber Company, The. Adhesion of rubber to aramid cords. 4,409,055., Cl. 156-307.500.

Elmy, Raymond L.; and Crabtree, Joe, to Murray Ohio Manufacturing Co., The. Combined clutch and braking arrangement for a tractor. 4,408,683., Cl. 192-11.000.

Emdener Strasse: *See*—
Hack, Adolf, 4,408,975., Cl. 425-231.000.
Emhart Industries, Inc.: *See*—
Finkle, Louis J., 4,409,589., Cl. 340-396.000.
EMPI, Inc.: *See*—
Maurer, Donald D., 4,408,607., Cl. 128-419.00R.
Endo, Tadashi: *See*—
Sato, Tadao; Endo, Tadashi; Fukunaga, Osamu; and Iwata, Minoru, 4,409,193., Cl. 423-290.000.
Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; and Madan, Arun, 4,409,605., Cl. 357-2.000.
Enertec: *See*—
Bazin, Alain, 4,409,545., Cl. 324-107.000.
Eng, Fe C. Decorative mounting system. 4,408,408., Cl. 40-617.000.
Engel, Joseph R. Self-cleaning mirror. 4,408,991., Cl. 433-30.000.
Enjoji, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Probe for ultrasonic imaging apparatus. 4,408,611., Cl. 128-660.000.
Enomoto, Hiromu; Mitono, Yoshiharu; Yasuda, Yasushi; Imaizumi, Taketo; and Ohta, Hiroshi, to Fujitsu Limited. Schmitt trigger circuit with low input current. 4,409,495., Cl. 307-290.000.
Enomoto, Shigeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Picture division type automatic exposure control device for television camera. 4,409,620., Cl. 358-228.000.
Eoga, Anthony B. J., to Warner-Lambert Company. Tablet forming cleanser composition and method of preparation. 4,409,118., Cl. 252-99.000.
Epson Corporation: *See*—
Ishii, Hiroshi, 4,409,596., Cl. 346-1.100.
Minowa, Masahiro, 4,409,600., Cl. 346-76.0PH.
Shimodaira, Tadayoshi, 4,408,911., Cl. 400-208.000.
Equity Oil Company: *See*—
Dougan, Paul N., 4,408,665., Cl. 166-266.000.
Erco Industries Limited: *See*—
Reeve, Douglas W.; and Rapson, W. Howard, 4,409,066., Cl. 162-88.000.
Eremenko, Boris S.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.
Erickson, Lloyd A.: *See*—
Graff, Henry W.; and Erickson, Lloyd A., 4,408,939., Cl. 411-112.000.
Erickson, Roman R., to Gas Service Energy Corporation. Temperature compensated gauge for pressurized gas such as natural gas fuel for vehicles. 4,408,484., Cl. 73-149.000.
Eriez Manufacturing Company: *See*—
Torrey, Rodney J.; Astemborski, Dennis; Carner, Marshall A.; and Rose, Gerald D., 4,409,007., Cl. 55-112.000.
Erni, Bruno: *See*—
Vuilleumier, Cyril; and Erni, Bruno, 4,408,898., Cl. 368-220.000.
Ernst, Donald M.: *See*—
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., 4,408,661., Cl. 165-164.000.
Ernst, Horst M.: *See*—
Walter, Lóthar; Ernst, Horst M.; Brandenstein, Manfred; Kiener, Heinz; and Friedrich, Wolfgang, 4,408,809., Cl. 308-187.100.
Ernst Leitz Wetzlar GmbH: *See*—
Lindmo, Tore; and Steen, Harald B., 4,408,877., Cl. 356-38.000.
Esch, Frederick S.: *See*—
Ling, Nicholas C.; Guillemin, Roger C. L.; Ying, Shao-Yao; and Esch, Frederick S., 4,409,139., Cl. 260-112.00R.
Esge-Marby GmbH & Co. KG: *See*—
Niemann, Heinz, 4,408,705., Cl. 224-39.000.
Etablissement Texcontor: *See*—
Maltz, Javier E., 4,409,138., Cl. 260-112.00R.
Eto, Kunihiko: *See*—
Tomita, Tamaki; Nakao, Hisaji; Nishimura, Hideo; Eto, Kunihiko; and Ohmura, Haruo, 4,408,933., Cl. 408-8.000.
Eto, Yoshizumi; and Hirano, Yasuhiro, to Hitachi Denshi Kabushiki Kaisha. Video signal decoding circuit. 4,409,627., Cl. 360-38.100.
Evans, Donald B.: *See*—
Toy, Albert; Constantino, Louis L.; and Evans, Donald B., 4,409,174., Cl. 264-313.000.
Evjen, John M., to General Electric Company. Support means for plug-in transformer/charger. 4,409,536., Cl. 320-2.000.
Excelermatic Inc.: *See*—
Kraus, Charles E., 4,408,502., Cl. 74-789.000.
Kraus, Charles E., 4,408,503., Cl. 74-798.000.
Exxon Research and Engineering Co.: *See*—
Bearden, Roby, Jr.; and Stuntz, Gordon, 4,409,093., Cl. 208-108.000.
Brois, Stanley J.; Gutierrez, Antonio; and Ryer, Jack, 4,409,114., Cl. 252-75.000.
Langer, Arthur W., Jr.; Doyle, Gerald; Burkhardt, Terry J.; and Looney, Ralph W., 4,409,409., Cl. 585-255.000.
Langer, Arthur W., Jr., 4,409,414., Cl. 585-524.000.
Nadkarni, Ramachandra A.; and Williams, Rollie B., 4,408,999., Cl. 44-1.0SR.
Osman, Robert M., 4,409,191., Cl. 423-220.000.
Wagner, John P.; and Hsu, Edward C., 4,409,078., Cl. 204-188.000.
Ezaki, Atsuo; and Murakami, Takeshi, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive material. 4,409,322., Cl. 430-523.000.
Fa. Erwin Kampf GmbH & Co.: *See*—
Hutzenlaub, Armin S. P.; and Schmidt, Willi, 4,408,474., Cl. 72-205.000.
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., to General Tire & Rubber Company, The. Repair apparatus. 4,408,558., Cl. 118-59.000.
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., to General Tire & Rubber Company, The. Method for repairing glass fiber reinforced plastic parts and product. 4,409,270., Cl. 428-63.000.
Faccini, Ernest: *See*—
Williams, Harry S.; Yates, Jan B.; Reidy, John J.; Faccini, Ernest; Hill, Terry E.; and Shafley, William K., 4,408,405., Cl. 37-62.000.
Factor, Neal. System for the regulation of light for a sequential picture apparatus. 4,408,838., Cl. 350-347.00E.
Fag Kugelfischer Georg Schafer & Co.: *See*—
Peuker, Karl, 4,408,902., Cl. 374-27.000.
Fairchild Camera & Instrument Corporation: *See*—
Stinehelfer, Jonathan J., 4,409,675., Cl. 365-201.000.
Varshney, Ramesh C., 4,409,676., Cl. 365-201.000.
Falvo, Joseph S.: *See*—
Wolff, Martin J.; and Falvo, Joseph S., 4,408,919., Cl. 401-12.000.
Fanuc Ltd.: *See*—
Kobari, Katsuo; and Hachisuka, Yoshiaki, 4,409,648., Cl. 363-54.000.
Farrell, Sherman R.: *See*—
Loda, Gary K.; and Farrell, Sherman R., 4,409,511., Cl. 313-34.000.
Favareto, Marcello; and Anselmino, Renato, to Comau S.p.A. Automatic device for changing an electric welding gun, operated by the arm of a programmable manipulator. 4,409,464., Cl. 219-136.000.
Feddeler, Lester H.: *See*—
DeWitt, Robert W.; and Feddeler, Lester H., 4,408,743., Cl. 248-285.000.
Fehrman, Richard G.: *See*—
Nienart, Louis F.; Fehrman, Richard G.; and Wan, Chung-Chu, 4,408,653., Cl. 164-463.000.
Feld, Gundolf: *See*—
Soraya, Sorayapour; Feld, Gundolf; and Wacker, Fredy, 4,408,986., Cl. 432-6.000.
Feldman, Julian, to National Distillers and Chemical Corporation. Process for recovering ethanol from dilute aqueous solutions employing liquid extraction media. 4,409,406., Cl. 568-916.000.
Feller, William F.; Kantor, Judith A.; Chirikjian, Jack G.; and Phillips, Terence M., to Research Corporation. Reverse transcriptase from human milk, method for its purification, and its use in the detection of breast cancer. 4,409,200., Cl. 436-516.000.
Fendt, Alfons: *See*—
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,409,542., Cl. 324-57.00Q.
Ferag AG: *See*—
Meier, Jacques, 4,408,754., Cl. 270-52.000.
Meier, Jacques, 4,408,755., Cl. 270-52.000.
Ferguson, James M.; Chen, Thomas Y.; and Gibson, Walter G., to RCA Corporation. Video disc player having vertical timing signal generator. 4,409,626., Cl. 358-338.000.
Ferguson, Joseph E.: *See*—
Dominguez, Manuel F.; and Ferguson, Joseph E., 4,408,570., Cl. 122-510.000.
Ferrari, Harry. Strung racquet. 4,408,760., Cl. 273-73.00D.
Ferrero, Giovanni, to Ferrero S.p.A. Beverage container pierceable by a drinking straw. 4,408,690., Cl. 206-222.000.
Ferrero S.p.A.: *See*—
Ferrero, Giovanni, 4,408,690., Cl. 206-222.000.
Fetchin, John A., to Maine. Preparation of CoMo and NiMo catalyst using cobalt or nickel complexes that are stable in basic solution. 4,409,131., Cl. 502-263.000.
Feurer, Bernard; and Baronet, Philippe, to Alcon Pharmaceuticals Limited. Treatment process for rendering corneal contact lenses hydrophilic. 4,409,258., Cl. 427-38.000.
Fiber Materials, Inc.: *See*—
McAllister, Lawrence E.; and Dietrich, Herbert, 4,409,361., Cl. 524-876.000.
Fiedler, Otto K.: *See*—
Wangler, Alfred; and Fiedler, Otto K., 4,408,430., Cl. 52-585.000.
Figgie International: *See*—
Bartsch, Walter F., 4,408,687., Cl. 198-491.000.
Fike, Lester L., Jr.: *See*—
Tyree, Charles N.; Fike, Lester L., Jr.; and McIntire, Ronald A., 4,409,443., Cl. 200-83.00N.
Fike Metal Products Corporation: *See*—
Tyree, Charles N.; Fike, Lester L., Jr.; and McIntire, Ronald A., 4,409,443., Cl. 200-83.00N.
Fillmore, William E.; Mumford, George V.; and Smalley, Ned J., to Owens-Illinois, Inc. Multi-part dispensing closure having a frangible connecting web. 4,408,700., Cl. 222-153.000.
Finch, Harry: *See*—
Collington, Eric W.; Finch, Harry; Newton, Roger F.; and Wallis, Christopher J., 4,409,213., Cl. 424-244.000.
Finkle, Louis J., to Emhart Industries, Inc. Adjustable electric bell. 4,409,589., Cl. 340-396.000.
Fischbach, Jean-Paul F., to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Method and apparatus for measuring emissivity. 4,408,878., Cl. 356-43.000.
Fischell, Norman L. Apparatus and process for nesting drum bodies. 4,408,390., Cl. 29-822.000.

Fischer, Bertram. Apparatus for ascertaining the quantity of ozone in water. 4,409,183., Cl. 422-68.000.

Fischer, Mark L. Bolt anchor assembly. 4,408,940., Cl. 411-258.000.

Fischer & Porter Company: *See*—
Shauger, Herbert A., 4,409,660., Cl. 364-510.000.

Fisher, Alan R.: *See*—
Liang, Po-lung; and Fisher, Alan R., 4,408,501., Cl. 74-688.000.

Fisons Limited: *See*—
Cairns, Hugh; Greenhalgh, Peter M.; and Howlett, Brian, 4,409,237., Cl. 424-283.000.

Fitzgerald, Robert W., Jr.; Hall, Robert L.; and Bickford, Gary P., to Schlumberger Technology Corporation. Fiber optic transducers. 4,408,829., Cl. 350-96.290.

Flaig, Hans, to Gebruder Junghans GmbH. Electronic clock striking mechanism. 4,408,899., Cl. 368-273.000.

Flinn, Ian: *See*—
Milsom, Robert F.; Murray, Robert J.; and Flinn, Ian, 4,409,571., Cl. 333-196.000.

Flocchini, Andrew J. Milking apparatus. 4,408,564., Cl. 119-14.080.

FMC Corporation: *See*—
McTamaney, Louis S.; and Haley, Frank P., 4,408,943., Cl. 414-138.000.
Ragan, Marshall P., 4,408,879., Cl. 356-155.000.

Focht, Louis R., to Ford Motor Company. Piezoelectric apparatus for generating electrically distinguishable bipolar signals. 4,409,548., Cl. 324-168.000.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Belt lock for a safety belt. 4,408,374., Cl. 24-230.00A.

Forbus, Nancy P.; and Kaeding, Warren W., to Mobil Oil Corporation. Organophosphorus-treated zeolite catalysts for para-selective aromatics conversion. 4,409,132., Cl. 502-62.000.

Ford Aerospace & Communications Corporation: *See*—
Park, Pyong K., 4,409,595., Cl. 343-771.000.

Ford Motor Company: *See*—
Focht, Louis R., 4,409,548., Cl. 324-168.000.
Holubka, Joseph W., 4,409,380., Cl. 528-45.000.
Holubka, Joseph W., 4,409,381., Cl. 528-45.000.
Liang, Po-lung; and Fisher, Alan R., 4,408,501., Cl. 74-688.000.

Forker, Richard O. Toy aircraft and method of operation. 4,408,412., Cl. 46-89.000.

Forkner, John H. Egg product and process of manufacture. 4,409,249., Cl. 426-100.000.

Forney, Edgar W., Jr., to AMP Incorporated. Connector for semi-rigid coaxial cable. 4,408,821., Cl. 339-177.00R.

Forsell, Ragnar: *See*—
Andersson, Kjell; and Forsell, Ragnar, 4,408,750., Cl. 266-216.000.

Forster, Karl-Heinz: *See*—
Johne, Hans; Forster, Karl-Heinz; Jentzsch, Arndt; and Muller, Wolfgang, 4,408,528., Cl. 101-364.000.

Forster, Siegfried, to Kernforschungsanlange Julich Gesellschaft mit beschrankter Haftung. Burner for the formation and combustion of an ignitable mixture of a liquid fuel and combustion air. 4,408,984., Cl. 431-354.000.

Forsyth, Robert W. Wheeled vehicle support apparatus. 4,408,646., Cl. 152-179.000.

Forth, Hans-Joachim, to Leybold Heraeus GmbH. Refrigerator cryostat. 4,408,469., Cl. 62-514.00R.

Fortier, Michel, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laser-guided bomb trainer. 4,408,537., Cl. 102-395.000.

Fortier, Richard C.: *See*—
Leon, Gonzalo S.; Fraize, John E.; and Fortier, Richard C., 4,409,171., Cl. 264-120.000.

Fossel, Eric T.; and Delayre, Jean L., to President and Fellows of Harvard College. NMR Sodium images. 4,409,550., Cl. 324-300.000.

Foster Wheeler Energy Corporation: *See*—
Skinner, Geoffrey F.; and Kowal, Wieslaw M., 4,409,196., Cl. 423-359.000.

Fotland, Richard A., to Dennison Manufacturing Company. Electrostatic imaging device. 4,409,604., Cl. 346-159.000.

Fraiberg, Igor, to Gearhart Industries, Inc. Threaded joint toggle-locked with a helical spring. 4,408,927., Cl. 403-320.000.

Fraize, John E.: *See*—
Leon, Gonzalo S.; Fraize, John E.; and Fortier, Richard C., 4,409,171., Cl. 264-120.000.

Framatome: *See*—
Commeau, Alain, 4,409,466., Cl. 219-137.00R.

Franck, Klaus; Sauer, Werner; and Wiesmann, Herbert L., to Wilkhahn, Wilkening & Hahne GmbH & Co. Furniture article with padding attached to a supporting shell. 4,408,797., Cl. 297-218.000.

Frank, Alan M.; and Edwards, William R. Long lifetime, low intensity light source for use in nighttime viewing of equipment maps and other writings. 4,409,643., Cl. 362-157.000.

Frank, Gary L.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Frank, Lee F., to Eastman Kodak Company. Method and circuit for controlling an electromagnetic actuator in photographic apparatus. 4,408,857., Cl. 354-234.000.

Franssell, Dean E.: *See*—
Van Hulle, Glenn J.; Anker, Charles A.; and Franssell, Dean E., 4,409,250., Cl. 426-242.000.

Fraser, Kenneth D.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Frauenglass, Elliott: *See*—
Holmes, Mark; and Frauenglass, Elliott, 4,409,111., Cl. 252-30.000.

Frechette, Thomas E., to Royal Business Machines, Inc. Inked ribbon cartridge ribbon with supply spool drag device. 4,408,913., Cl. 400-208.000.

Freiberg, Ashley H., to Stauffer Chemical Company. Systemic control of insect infestations in animals by use of O,O-dimethyl-2,2,2-trichloro-2-(tetrahydropyranyl-2-oxy)ethylphosphonate. 4,409,211., Cl. 424-203.000.

Frelund, Arthur R., to General Motors Corporation. Fuel injection nozzle with grooved poppet valve. 4,408,722., Cl. 239-453.000.

Frensch, Heinz: *See*—
Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, 4,409,201., Cl. 424-32.000.

Frerichs, Udo: *See*—
Kuhn, Dieter; Rach, Heinz-Dieter; Frerichs, Udo; and Pieper, Henner, 4,408,647., Cl. 152-330.0RF.

Friedrich Schroeder, Firma: *See*—
Motz, Heinz D., 4,408,941., Cl. 411-378.000.

Friedrich, Wolfgang: *See*—
Walter, Lothar; Ernst, Horst M.; Brandenstein, Manfred; Kiener, Heinz; and Friedrich, Wolfgang, 4,408,809., Cl. 308-187.100.

Friello, Dominick R.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Hopkins, Walter; Parker, Ellery; and Mackay, Donald A. M., 4,409,244., Cl. 426-5.000.

Friemert, Horst, to Siemens Aktiengesellschaft. System for arranging ferromagnetic coil springs and feeding same to a work station. 4,408,624., Cl. 134-133.000.

Frimet, Stanley H.; and Meeks, Leighton A., to Honeywell, Inc. Tape transport speed control using a playback data derived clock signal. 4,409,628., Cl. 360-73.000.

Froix, Michael F.; and Kusumgar, Rajal M., to Celanese Corporation. Thermoplastic blend of oxymethylene copolymers exhibiting improved impact resistance. 4,409,370., Cl. 525-414.000.

Fromion, Andre: *See*—
Deprez, Michel; Fromion, Andre; Hardouin, Claude; and Vilas Boas, Jean C., 4,408,835., Cl. 350-117.000.

Frommann, Klaus, to Mannesmann Aktiengesellschaft. Method and apparatus for the one-sided coating of continuous metal strip. 4,409,265., Cl. 427-271.000.

Fromont, Jacques; and Plancon, Marcel, to Jeumont-Schneider Corporation. Procedure and device for rolling metals without stress. 4,408,470., Cl. 72-8.000.

Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrrolo[3,4-D][2]Benzazepines. 4,409,390., Cl. 548-561.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Yabuhara, Hideo; and Kudo, Ichiro, 4,408,584., Cl. 123-440.000.

Fuji Photo Film Co., Ltd.: *See*—
Hoshi, Yoshiyuki; and Hayashi, Takayuki, 4,409,156., Cl. 264-4.330.
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,409,324., Cl. 430-546.000.
Kitamoto, Tatsuji; and Akashi, Goro, 4,409,281., Cl. 428-212.000.
Mizuno, Chiaki; Tamai, Yasuo; and Kasuga, Akira, 4,409,299., Cl. 428-694.000.
Ogawa, Hiroshi; Kasuga, Akira; Tamai, Yasuo; and Yamada, Yasuyuki, 4,409,291., Cl. 428-425.900.
Ooishi, Kengo; and Suzuki, Osamu, 4,408,733., Cl. 242-199.000.
Watanabe, Shojiro, 4,408,781., Cl. 282-27.500.
Yagihara, Morio; Hirano, Tsumoru; Mihayashi, Keiji; and Ozawa, Takashi, 4,409,320., Cl. 430-381.000.

Fuji Xerox Co., Ltd.: *See*—
Ogasawara, Satoru, 4,409,625., Cl. 358-288.000.
Oka, Kozo, 4,409,309., Cl. 430-65.000.

Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, to Toa Nenryo Kogyo Kabushiki Kaisha. Nonwoven fabrics. 4,409,282., Cl. 428-219.000.

Fujii, Yozo; and Shiozawa, Takao, to Konishiroku Photo Industry Co., Ltd. Optical scanning unit driving device for electrophotographic reproducing apparatus. 4,408,867., Cl. 355-8.000.

Fujimastu, Wataru: *See*—
Onodera, Kaoru; Iijima, Toshifumi; and Fujimastu, Wataru, 4,409,321., Cl. 430-383.000.

Fujimoto, Noboru: *See*—
Ito, Motoya; Fujimoto, Noboru; Takahashi, Noriyoshi; Watanabe, Masatoshi; and Yamashita, Seizi, 4,409,506., Cl. 310-166.000.

Fujimoto, Tsuneo: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; Fujimoto, Tsuneo; and Kubota, Minoru, 4,409,197., Cl. 423-415.00P.

Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, to Chugai Seiyaku Kabushiki Kaisha. Pyrazoloindazole derivatives and bronchodilating composition. 4,409,234., Cl. 424-273.00N.

Fujisawa Pharmaceutical, Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,214., Cl. 424-246.000.

Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,215., Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,409,217., Cl. 424-246.000.
Fujitsu Limited: *See—*
Baba, Fumio, 4,409,496., Cl. 307-296.00R.
Enomoto, Hiromu; Mitono, Yoshiharu; Yasuda, Yasushi; Imaizumi, Taketo; and Ohta, Hiroshi, 4,409,495., Cl. 307-290.000.
Fukuda, Takeshi, 4,409,609., Cl. 357-55.000.
Kiriseko, Tadashi, 4,408,387., Cl. 29-576.00E.
Kurafuji, Setsuo; and Tanimoto, Kazuo, 4,409,679., Cl. 365-227.000.
Kurihara, Hiroshi, 4,409,562., Cl. 331-1.00A.
Majima, Teiji, 4,408,875., Cl. 355-53.000.
Takahashi, Yukio, 4,409,674., Cl. 365-190.000.
Takemae, Yoshihiro, 4,409,672., Cl. 365-149.000.
Takemae, Yoshihiro; and Nakano, Masao, 4,409,677., Cl. 365-206.000.
Takemae, Yoshihiro; and Baba, Fumio, 4,409,678., Cl. 365-206.000.
Fujiwara, Junji: *See—*
Takano, Ikuo; Umino, Hiroshi; and Fujiwara, Junji, 4,409,449., Cl. 200-153.0SC.
Fujiwara, Katsuji, to TLV Co., Ltd. Valve seat assembly for a steam trap. 4,408,626., Cl. 137-185.000.
Fujiwara, Kazuaki; and Konishi, Akio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Fire retardant acrylic fibers containing organo-tin-sulfur compound having high degree of glossiness. 4,409,350., Cl. 524-180.000.
Fukahori, Hidehiko; Iwashita, Tomonori; and Nakamura, Katsunori, to Canon Kabushiki Kaisha. Speed governor for camera. 4,408,859., Cl. 354-274.000.
Fukuda, Takeshi, to Fujitsu Limited. Semiconductor device and method of manufacturing the same. 4,409,609., Cl. 357-55.000.
Fukui, Koichiro: *See—*
Hashimoto, Michitaka; and Fukui, Koichiro, 4,408,655., Cl. 165-104.270.
Fukunaga, Osamu: *See—*
Sato, Tadao; Endo, Tadashi; Fukunaga, Osamu; and Iwata, Minoru, 4,409,193., Cl. 423-290.000.
Fukunaga, Yukio: *See—*
Arima, Sumitsugu; Tsujimura, Harutoshi; and Fukunaga, Yukio, 4,409,584., Cl. 340-22.000.
Fukutomi, Hiroshi: *See—*
Tabayashi, Isao; Soma, Hiromi; and Fukutomi, Hiroshi, 4,409,040., Cl. 106-20.000.
Fulton, William: *See—*
Gurbst, Herbert S.; and Fulton, William, 4,408,758., Cl. 272-85.000.
Funada, Fumiaki: *See—*
Kozaki, Syuichi; Funada, Fumiaki; and Minezaki, Shigehiro, 4,408,837., Cl. 350-336.000.
Furumoto, Michitake; and Harada, Shinichi, to Nippon Carbureter Co., Ltd. Liquid fuel combustion apparatus. 4,408,593., Cl. 126-85.00R.
Furuta, Naofumi; and Ohi, Kunio, to Sunx Limited. Apparatus for detecting an object. 4,409,473., Cl. 250-206.000.
Furuta, Tadaaki; and Tabata, Shunsaku, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus and method for separating blood components. 4,409,106., Cl. 210-732.000.
Futamura, Shoji: *See—*
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,409,457., Cl. 219-69.00M.
G. Siempelkamp GmbH & Co.: *See—*
Wons, Hubert; and Sitzler, Hans-Dietrich, 4,408,520., Cl. 100-93.00P.
Gabbrielli Impianti di Gabbrielli Franco & C.s.a.s.: *See—*
Taverna, Andrea, 4,408,686., Cl. 198-433.000.
Gaetani, Quintino; Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, to L'Oreal. Copolymerization process initiated with bis (4-tert. butyl cyclohexyl) peroxydicarbonate and aerosol hair lacquer containing the copolymer so produced. 4,409,379., Cl. 526-230.500.
Gagnebin, Gaston, to Societe Suisse pour l'Industrie Horlogere Management Services, S.A. Miniature pushbutton. 4,408,901., Cl. 368-321.000.
Galliani, Giulio: *See—*
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, 4,409,388., Cl. 548-262.000.
Gallizia, Achille, to Industrie Pirelli S.p.A. Device for manufacturing closed hollow bodies in elastomeric material. 4,408,980., Cl. 425-501.000.
Gamble, Barry I. Controllable telephone call annunciator. 4,409,439., Cl. 179-84.00C.
Gamet, Lucien: *See—*
Willem, Michel; and Gamet, Lucien, 4,409,432., Cl. 174-172.000.
Gansert, Willi: *See—*
Jakob, Gert; Gansert, Willi; Goetzke, Siegfried; and Ruttkowski, Lothar, 4,409,641., Cl. 361-386.000.
Gardner, Harlis. Framed wood block facing. 4,409,269., Cl. 428-50.000.
Garin, Torunn A.; and Vogel, Gerald J., to General Foods Corporation. Process for concentrating and isolating a beet colorant. 4,409,254., Cl. 426-540.000.
Garner, Henry C.; Broadbent, Jack; Savidge, David H.; and Wadsworth, Eric, to British Steel Corporation. Carriage mounted apparatus for detecting surface defects in flat surfaced metallic objects. 4,409,549., Cl. 324-262.000.
Gas Service Energy Corporation: *See—*
Erickson, Roman R., 4,408,484., Cl. 73-149.000.
Gasson, Brian C., to Beecham Group Limited. Derivatives of clavulanic acid, a process for their preparation and their use. 4,409,207., Cl. 424-114.000.
Gast, Fred C. Apparatus for indicating a line and for producing and visually displaying an image of a line indicator. 4,408,848., Cl. 353-11.000.
Gaster, Ivan: *See—*
Bryan, James S.; Gaster, Ivan; Tell, Mayo B.; and Dunn, Claude, 4,408,395., Cl. 30-179.000.
Gatayama, Tetsuya: *See—*
Kanno, Ken-ichi; Gatayama, Tetsuya; and Koyama, Masao, 4,409,088., Cl. 204-402.000.
Gates Rubber Company, The: *See—*
Stuemky, Robert E., 4,408,786., Cl. 285-256.000.
Gateway Industries, Inc.: *See—*
Miskowicz, John S., 4,408,373., Cl. 24-230.00A.
Gaylard, Bernard. Overhead electric transmission or distribution system. 4,409,429., Cl. 174-43.000.
Gearhart Industries, Inc.: *See—*
Fraiberg, Igor, 4,408,927., Cl. 403-320.000.
Gebruder Junghans GmbH: *See—*
Flaig, Hans, 4,408,899., Cl. 368-273.000.
Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck": *See—*
Reuter, Alfred, 4,408,510., Cl. 83-869.000.
Geesen, Michel, to Electronique Marcel Dassault. Apparatus for accurately timing an event relative to clock signals. 4,408,895., Cl. 368-118.000.
Geigle, Brigitte, legal representative: *See—*
Krause, Helmfried; Wobbermin, Hubertus; and Geigle, Edgar, deceased, 4,409,185., Cl. 422-113.000.
Geigle, Edgar, deceased: *See—*
Krause, Helmfried; Wobbermin, Hubertus; and Geigle, Edgar, deceased, 4,409,185., Cl. 422-113.000.
Gen Engineering Co., Ltd.: *See—*
Ono, Hiroshi, 4,409,435., Cl. 381-71.000.
General Dynamics Corporation: *See—*
Merrick, James W., 4,408,582., Cl. 123-415.000.
General Electric Company: *See—*
Baker, Lewin T., 4,409,590., Cl. 340-533.000.
Berti, John C.; and Williams, James W., 4,409,687., Cl. 455-7.000.
Bose, Bimal K., 4,409,534., Cl. 318-811.000.
Bose, Sanjay K., 4,409,593., Cl. 340-825.500.
Brown, Thomas W., 4,408,466., Cl. 62-208.000.
Carter, Gordon V.; and Tromble, Ralph D., 4,408,432., Cl. 52-718.000.
Devine, Thomas M., Jr., 4,408,709., Cl. 228-183.000.
Evjen, John M., 4,409,536., Cl. 320-2.000.
Hollenbeck, Robert K.; and Rickard, Jimmy R., 4,409,532., Cl. 318-749.000.
Jochym, Eric P., 4,409,278., Cl. 428-163.000.
Lee, Garland G., 4,409,351., Cl. 524-322.000.
Noeske, Heinz O., 4,409,447., Cl. 200-148.00A.
Roberts, Victor D., 4,409,521., Cl. 315-57.000.
Thomas, George L.; and Graff, William A., 4,409,516., Cl. 313-579.000.
Vandegraaf, Johannes J., 4,409,563., Cl. 331-11.000.
General Foods Corporation: *See—*
Garin, Torunn A.; and Vogel, Gerald J., 4,409,254., Cl. 426-540.000.
General Mills, Inc.: *See—*
Van Hulle, Glenn J.; Anker, Charles A.; and Franssell, Dean E., 4,409,250., Cl. 426-242.000.
General Motors Corporation: *See—*
Frelund, Arthur R., 4,408,722., Cl. 239-453.000.
Keller, Robert C., 4,408,675., Cl. 180-296.000.
Kurzrock, John W.; and Tramm, Peter C., 4,408,957., Cl. 416-237.000.
Poe, David T., 4,409,302., Cl. 429-88.000.
Wich, Thomas J., 4,408,718., Cl. 239-88.000.
General Signal Corporation: *See—*
Westveer, Robert C., 4,408,453., Cl. 60-445.000.
General Tire & Rubber Company, The: *See—*
Elmer, Otto C., 4,409,055., Cl. 156-307.500.
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., 4,408,558., Cl. 118-59.000.
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., 4,409,270., Cl. 428-63.000.
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,409,368., Cl. 525-314.000.
Wise, Richard M., 4,409,290., Cl. 428-378.000.
Wise, Richard M., 4,409,343., Cl. 523-206.000.
Georgetown University: *See—*
Ledley, Robert S., 4,409,616., Cl. 358-111.000.
Gerard, Francois; and Machat, Jean-Yves, to Compagnie Generale des Etablissements Michelin. Electrochemical device comprising at least two cells connected in electrical series. 4,409,304., Cl. 429-158.000.
Germanas, Dalia: *See—*
Qualeatti, Gail M.; and Germanas, Dalia, 4,409,148., Cl. 260-409.000.
Gerstle, Volker; Mauz, Gerhard; and Zondler, Rolf, to International Standard Electric Corporation. Method of preparing a phosphor suspension. 4,409,306., Cl. 430-28.000.
Geyer, Robert P., to Standard Car Truck Company. Resilient side bearing. 4,408,810., Cl. 308-226.000.

Gibson, Dale E., to Leupold & Stevens, Inc. Telescopic sight having lens holder tube with half socket pivot mount. 4,408,842., Cl. 350-560.000.

Gibson, Walter G.: *See*—
Ferguson, James M.; Chen, Thomas Y.; and Gibson, Walter G., 4,409,626., Cl. 358-338.000.

Gibson, William A.; and Ho, Ting C., to Gulf Oil Corporation. Catalyst particle sizing apparatus. 4,409,186., Cl. 422-131.000.

Gilleo, Kenneth B.; and Kreibich, Willard H., to Northern Engraving Corporation. Boss formation using low surface energy dams. 4,409,264., Cl. 427-265.000.

Giroir, William. Paraffin wrinkle and bubble remover apparatus. 4,409,184., Cl. 422-99.000.

Giulekas, Gus: *See*—
Zapisek, John M.; and Giulekas, Gus, 4,409,499., Cl. 307-468.000.

Givens, Wyatt W., to Mobil Oil Corporation. Method and system for the testing and calibration of radioactive well logging tools. 4,409,480., Cl. 250-252.100.

Gladich, Radisko S., to International Harvester Co. Sequence shifting coupling. 4,408,684., Cl. 192-53.00G.

Glaenzer Spicer: *See*—
Orain, Meidul, 4,408,806., Cl. 308-6.00R.

Glaxo Group Limited: *See*—
Collington, Eric W.; Finch, Harry; Newton, Roger F.; and Wallis, Christopher J., 4,409,213., Cl. 424-244.000.

Glaze, John R. Gage for laying blocks. 4,408,398., Cl. 33-180.00R.

Glazunov, Sergei G.: *See*—
Karinsky, Viktor N.; Musienko, Viktor T.; and Glazunov, Sergei G., 4,408,971., Cl. 425-8.000.

Gleize, Jacques; and Roy, Jean-Joseph, to Compagnie Generale de Geophysique. Method and apparatus for the production of seismic shocks. 4,408,677., Cl. 181-121.000.

Glover, Charles G., to Lodge & Shipley Company, The. Case packer for inverting bottles and depositing them in a case. 4,408,436., Cl. 53-247.000.

Godwin, Gurney L., to Westinghouse Electric Corp. Dynamoelectric machines for multiples of three phases with unbalanced fractional-slot windings. 4,409,507., Cl. 310-205.000.

Goetschi, Fred A. Method for producing characters and other representations, in particular title set, on a photo material. 4,409,305., Cl. 430-22.000.

Goetzke, Siegfried: *See*—
Jakob, Gert; Gansert, Willi; Goetzke, Siegfried; and Ruttkowski, Lothar, 4,409,641., Cl. 361-386.000.

Goffe, Wiliam L., to Xerox Corporation. Electrographic method and apparatus. 4,409,603., Cl. 346-155.000.

Goldberger, William M., to Superior Graphite Co. Process for the electrolytic reduction of metals and an improved particulate carbon electrode for the same. 4,409,073., Cl. 204-67.000.

Goldmann, Helmut, to Schering AG. Method and apparatus for the galvanic deposition of metal onto objects, cleaning off and recovery of adherent surface treatment agents. 4,409,082., Cl. 204-213.000.

Goldsmith, Aaron. Cleaning system having improved agitation. 4,408,366., Cl. 15-321.000.

Gomore, Stephen C.: *See*—
Murnane, Raymond J.; Gomore, Stephen C.; and Mathewson, Myron, 4,408,467., Cl. 62-296.000.

Gorbulev, Efim S.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.

Gordon, Carroll K.: *See*—
Hagen, Glenn E.; and Gordon, Carroll K., 4,408,454., Cl. 60-500.000.

Gordon, Harry W.; and Avila, Nanette R., to Del Laboratories, Inc. Non-nitrocellulose non-formaldehyde or formaldehyde resin nail polish employing an acrylate resin as the film former. 4,409,203., Cl. 424-61.000.

Gordon, James E.: *See*—
Chaplin, Christopher R.; Gordon, James E.; and Jeronimidis, Giorgio, 4,409,274., Cl. 428-112.000.

Gordon, Robert L.: *See*—
Naugle, George H.; Gordon, Robert L.; and Pines, Richard J., 4,409,053., Cl. 156-287.000.

Goring, Thomas E.: *See*—
Stewart, Graham G.; Goring, Thomas E.; and Russell, Ingeborg, 4,409,246., Cl. 426-16.000.

Gorre, Luisa E.: *See*—
Pastor, Ricardo C.; Chew, Remedios K.; and Gorre, Luisa E., 4,409,260., Cl. 427-82.000.

Gossard, David C.; West, John; Stelson, Kim A.; Allison, Blair; Webb, R. Davis, Jr.; and Hardt, David, to Massachusetts Institute of Technology. Press brake having spring-back compensating adaptive control. 4,408,471., Cl. 72-21.000.

Gotoh, Hiroshi: *See*—
Takahashi, Fumitaka; and Gotoh, Hiroshi, 4,408,490., Cl. 73-497.000.

Gotoh, Masao: *See*—
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.

Gowan, John G., to United States of America, Air Force. Hot pressed and diffusion bonded laser mirror heat exchanger. 4,408,833., Cl. 350-310.000.

Grabbe, Dimitry G.: *See*—
Apicelli, Samuel W.; and Grabbe, Dimitry G., 4,408,815., Cl. 339-95.00R.

Grace, Thomas T., Jr., to Borden, Inc. Flowable liquid fertilizer containing suspended water insoluble nitrogen. 4,409,015., Cl. 71-28.000.

Graf, Harlan G.: *See*—
Davis, Richard L.; Graf, Harlan G.; and Edwards, Don L., 4,409,068., Cl. 202-85.000.

Grafe, Alfred: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,409,236., Cl. 424-275.000.

Graff, Henry W.; and Erickson, Lloyd A., to Pathfinder Auto Lamp Company; and Illinois Tool Works Inc. Composite fastener for attaching splash guard. 4,408,939., Cl. 411-112.000.

Graff, William A.: *See*—
Thomas, George L.; and Graff, William A., 4,409,516., Cl. 313-579.000.

Graphoidal Developments Limited: *See*—
Brown, Roy, 4,409,010., Cl. 65-26.000.

Graze, Russell R., Jr.: *See*—
Clairmont, Floyd H., Jr.; and Graze, Russell R., Jr., 4,408,575., Cl. 123-41.350.

Graziani, Danio, to International Standard Electric Corporation. Apparatus for performing radio frequency pulse modulation with automatic modulation control. 4,409,594., Cl. 343-399.000.

Green, James P.; and Cobaris, Paul L. Hub assembly for roller skates. 4,408,803., Cl. 301-5.700.

Greenhalgh, Peter M.: *See*—
Cairns, Hugh; Greenhalgh, Peter M.; and Howlett, Brian, 4,409,237., Cl. 424-283.000.

Greenzweig, John E.: *See*—
Moulson, Thomas J.; and Greenzweig, John E., 4,409,344., Cl. 523-512.000.

Grell, Wolfgang: *See*—
Hurnaus, Rudolf; Griss, Gerhart; Sauter, Robert; Grell, Wolfgang; Kobinger, Walter; and Pichler, Ludwig, 4,409,220., Cl. 424-250.000.

Grenat, Bernard, to Societe Anonyme dite Compagnie Lyonnaise de Transmissions Optiques. Method and apparatus for manufacturing a watertight optical fiber cable. 4,409,154., Cl. 264-1.500.

Greulich, H. S.: *See*—
Schmalfeld, Jorg; Bruckner, Werner; Jacobs, Jorn; Greulich, H. S.; and Schlutter, A., 4,408,548., Cl. 110-347.000.

Griffin, Brian C., to Brian Griffin Pty. Limited. Laboratory supply arrangement. 4,408,543., Cl. 108-24.000.

Griffin, James E.; and Griffin, Lamar H. Gas pump lever hook member. 4,408,791., Cl. 294-1.00R.

Griffin, Lamar H.: *See*—
Griffin, James E.; and Griffin, Lamar H., 4,408,791., Cl. 294-1.00R.

Grill, Benjamin: *See*—
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, 4,409,638., Cl. 361-152.000.

Grinnell Fire Protection Systems Company, Inc.: *See*—
Beukema, John A., 4,408,788., Cl. 285-419.000.

Griss, Gerhart: *See*—
Hurnaus, Rudolf; Griss, Gerhart; Sauter, Robert; Grell, Wolfgang; Kobinger, Walter; and Pichler, Ludwig, 4,409,220., Cl. 424-250.000.

Grossman, David: *See*—
Lehle, Fredric R.; Maine, James W.; Grossman, David; Leavitt, Richard A.; and Putnam, Alan R., 4,408,414., Cl. 47-1.00R.

Grossman, Hyman, to Cambridge Instruments, Inc. Interference filter. 4,408,615., Cl. 128-696.000.

Grozdev, Sergei S.: *See*—
Salikhov, Zufar G.; Ivanov, Vasily A.; Vyatchinov, Viktor P.; Maltsev, Vladimir I.; Grozdev, Sergei S.; and Khodov, Nikolai V., 4,409,101., Cl. 210-266.000.

Gruller, David L., to Smith International Inc. Holddown apparatus. 4,408,783., Cl. 285-3.000.

Grumman Aerospace Corporation: *See*—
Kirschbaum, Nathan; and Sclafani, Augustus, 4,408,736., Cl. 244-100.00R.

Gruppo Lepetit S.p.A.: *See*—
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, 4,409,388., Cl. 548-262.000.

Gruzewski, Ronald L.: *See*—
DeCamp, James E.; Arndt, Raymond J.; and Gruzewski, Ronald L., 4,408,562., Cl. 118-669.000.

GTE Laboratories Incorporated: *See*—
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,409,003., Cl. 51-295.000.
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,409,004., Cl. 51-295.000.

GTE Products Corporation: *See*—
Coad, Brian C., 4,409,181., Cl. 420-502.000.
Louie, Edmund A., 4,408,925., Cl. 403-27.000.
Vanderpool, Clarence D.; and MacInnis, Martin B., 4,409,019., Cl. 75-0.5AA.

Guderley, Werner: *See*—
Wenzel, Jurgen-Michael; Guderley, Werner; and Hamel, Ernst, 4,408,945., Cl. 414-325.000.

Gueguen, Claude: *See*—
Bousquet, Jacques; Gueguen, Claude; and Vautier, Daniel, 4,409,130., Cl. 502-211.000.

Guelden, Ronald H., to Western Electric Company, Incorporated. Electrical adapter with snap-fitted jack and hood. 4,408,819., Cl. 339-154.00A.

Gueneau, Michel, to Societe Nationale Elf Aquitaine Tour Aquitane. Heating installation for premises for dwelling or industrial use. 4,408,715., Cl. 237-2.00B.

Guillemin, Roger C. L.: *See*—
Ling, Nicholas C.; Guillemin, Roger C. L.; Ying, Shao-Yao; and Esch, Frederick S., 4,409,139., Cl. 260-112.00R.

Gulf Oil Corporation: *See*—
Gibson, William A.; and Ho, Ting C., 4,409,186., Cl. 422-131.000.

Gulf Research & Development Company: *See*—
Morganson, Neal E.; and Vayda, Adam V., 4,409,415., Cl. 585-525.000.
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,409,404., Cl. 568-902.000.
Silver, Richard S., 4,409,329., Cl. 435-105.000.

Gundel, Jamos: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Jamos; and Magyar, Karoly, 4,409,219., Cl. 424-250.000.

Gurbst, Herbert S.; and Fulton, William, to Roth American, Inc. Foot support for lawn chair swing. 4,408,758., Cl. 272-85.000.

Gurney, Gerald W.: *See*—
Redmann, Jerry L., Jr.; and Gurney, Gerald W., 4,408,808., Cl. 308-187.000.

Gustafson, Gary B., to Eastman Kodak Company. Receiver sheet transport with alignment means. 4,408,866., Cl. 355-3.0TR.

Gusums Bruk AB: *See*—
Strom, Jan T., 4,408,638., Cl. 139-425.00A.

Gusyatsky, Iosif A.: *See*—
Azarevich, Gennady M.; Maximov, Jury V.; Akimov, Boris I.; and Gusyatsky, Iosif A., 4,408,472., Cl. 72-71.000.

Guth, Christian; and Binz, Jorg, to Ciba-Geigy Corporation. Process for dyeing or finishing textile fibre materials with foamed aqueous liquor containing ethylene oxide-propylene oxide block co-polymer. 4,408,995., Cl. 8-477.000.

Guthrie, Richard W.; and Byrne, Dale M., to United Technologies Corporation. Imaging system for hostile environment optical probe. 4,408,827., Cl. 350-96.100.

Gutierrez, Antonio: *See*—
Brois, Stanley J.; Gutierrez, Antonio; and Ryer, Jack, 4,409,114., Cl. 252-75.000.

Gutmann, James L.: *See*—
Jefferies, Steven R.; Gutmann, James L.; and Heatfield, Barry M., 4,409,332., Cl. 435-188.000.

GX-Holding AG: *See*—
Jaeger, Walter, 4,409,610., Cl. 358-12.000.

Gyurina, F. Dennis: *See*—
Smith, Edward F., III; and Gyurina, F. Dennis, 4,409,295., Cl. 428-591.000.

H & H Industries, Inc.: *See*—
Coy, Donald L.; and McEvers, Dale L., 4,408,506., Cl. 82-20.000.

Haaf, Franz: *See*—
Brandstetter, Franz; and Haaf, Franz, 4,409,363., Cl. 525-67.000.

Haag, Werner O.; and Huang, Tracy J., to Mobil Oil Corporation. Process for producing alkyl aromatic compounds. 4,409,412., Cl. 585-454.000.

Haas, Gunther; Plass, Ludolf; and Lohrberg, Karl, to Metallgesellschaft Aktiengesellschaft. Electrolytic cell. 4,409,086., Cl. 204-269.000.

Haas, Paul A.; and Stines, William B. Method for improved decomposition of metal nitrate solutions. 4,409,157., Cl. 264-0.500.

Haase, Harry. Double walled underground storage containers for fluids such as heating oil which endanger the ground water and a method for their manufacture. 4,408,420., Cl. 52-1.000.

Haataja, Bruce A., to Michigan Technological University, Board of Control of. Molded wood particle pallet having increased bending strength. 4,408,544., Cl. 108-53.300.

Hachisuka, Yoshiaki: *See*—
Kobari, Katsuo; and Hachisuka, Yoshiaki, 4,409,648., Cl. 363-54.000.

Hack, Adolf, to Emdener Strasse. Tablet press. 4,408,975., Cl. 425-231.000.

Hadley, Michael S., to Beecham Group Limited. Substituted benzamides. 4,409,225., Cl. 424-256.000.

Haeder, Wolfgang: *See*—
Boscher, Georg; and Haeder, Wolfgang, 4,409,430., Cl. 174-92.000.

Hafele KG: *See*—
Kubler, Eberhard, 4,408,923., Cl. 403-20.000.

Hagen, Glenn E.; and Gordon, Carroll K., to Sea Energy Corporation. Fluid coupled wave generator array with subsea structure. 4,408,454., Cl. 60-500.000.

Hagino, Michiyoshi: *See*—
Shimoda, Nobuyoshi; and Hagino, Michiyoshi, 4,408,790., Cl. 293-122.000.

Hainke, Hans U.: *See*—
Hainke, Volker; and Hainke, Hans U., 4,408,937., Cl. 411-42.000.

Hainke, Volker; and Hainke, Hans U., to Volker, Hainke. Anchor bolt. 4,408,937., Cl. 411-42.000.

Hale, John R., to RCA Corporation. Glass support rod for use in electron-gun mount assemblies. 4,409,279., Cl. 428-192.000.

Haley, Frank P.: *See*—
McTamaney, Louis S.; and Haley, Frank P., 4,408,943., Cl. 414-138.000.

Hall, Robert L.: *See*—
Fitzgerald, Robert W., Jr.; Hall, Robert L.; and Bickford, Gary P., 4,408,829., Cl. 350-96.290.

Halliburton Company: *See*—
Borchardt, John K.; and Brown, David L., 4,409,110., Cl. 252-8.55D.
Carney, Leroy L.; Loftin, Royal E.; Anderson, Thomas E.; and Vasquez, Guillermo, 4,409,108., Cl. 252-8.50C.
Rao, Prabhakar P., 4,409,662., Cl. 364-557.000.
Smith, Harry D., Jr.; Schultz, Ward E.; and Verbout, Jerry L., 4,409,481., Cl. 250-270.000.

Ham, George E., to Dow Chemical Company, The. Stabilized polycarbonate compositions. 4,409,349., Cl. 524-108.000.

Ham, William E.: *See*—
Kleinknecht, Hans P.; Ham, William E.; and Meier, Heinrich, 4,408,884., Cl. 356-355.000.

Hamel, Ernst: *See*—
Wenzel, Jurgen-Michael; Guderley, Werner; and Hamel, Ernst, 4,408,945., Cl. 414-325.000.

Hammerschmidt, Winrich B.: *See*—
Seidel, Hartmut; and Hammerschmidt, Winrich B., 4,408,401., Cl. 36-3.00B.

Hamon-Sobelco, S.A.: *See*—
Paquet, Andre J., 4,408,460., Cl. 60-678.000.

Hanamoto, Mark S.; and Tanaka, Steve K., to Bio-Rad Laboratories, Inc. Method for eliminating glucose dependent Schiff base effect from hemoglobin A_1 assay. 4,409,335., Cl. 436-67.000.

Hanciishi, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Click stop device. 4,408,499., Cl. 74-527.000.

Hansen, Erling: *See*—
Berth, Jorgen; Hansen, Erling; Heaven, Malcolm D.; and Petersen, Tommy, 4,409,177., Cl. 264-531.000.

Hanslik, Wilhelm, to American Maplan Corporation. Double-worm extrusion press. 4,408,888., Cl. 366-83.000.

Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., to University of Utah. Process for recovering products from tar sand. 4,409,090., Cl. 208-11.0LE.

Hara, Toshizo: *See*—
Sutoh, Shinji; Hara, Toshizo; Harada, Takeshi; and Eda, Masahiro, 4,408,660., Cl. 165-21.000.

Harada, Hiroshi: *See*—
Minegishi, Keiichi; Akiba, Tokuji; Harada, Hiroshi; Takei, Akihiko; and Abe, Motoshi, 4,409,030., Cl. 106-97.000.

Harada, Shigeo: *See*—
Tosima, Soitiro; and Harada, Shigeo, 4,409,333., Cl. 436-2.000.

Harada, Shinichi: *See*—
Furumoto, Michitake; and Harada, Shinichi, 4,408,593., Cl. 126-85.00R.

Harada, Takeshi: *See*—
Sutoh, Shinji; Hara, Toshizo; Harada, Takeshi; and Eda, Masahiro, 4,408,660., Cl. 165-21.000.

Harasaki, Hayathugu, to Toyo Kogyo Co., Ltd. Support column for automobile wheel suspension assembly. 4,408,794., Cl. 296-198.000.

Hardenbrook, James M., to Xerox Corporation. Apparatus for inducing an electrostatic image in a conductive member. 4,408,864., Cl. 355-3.0TE.

Hardouin, Claude: *See*—
Deprez, Michel; Fromion, Andre; Hardouin, Claude; and Vilas Boas, Jean C., 4,408,835., Cl. 350-117.000.

Hardt, David: *See*—
Gossard, David C.; West, John; Stelson, Kim A.; Allison, Blair; Webb, R. Davis, Jr.; and Hardt, David, 4,408,471., Cl. 72-21.000.

Hargis, Ivan G.: *See*—
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,409,368., Cl. 525-314.000.

Harley-Davidson Motor Co., Inc.: *See*—
Huebner, Richard, 4,408,924., Cl. 403-23.000.

Harlow, Justin E.: *See*—
Ports, Kenneth A.; and Harlow, Justin E., 4,409,686., Cl. 382-8.000.

Harnischfeger Corporation: *See*—
Marsch, James E.; and Eckert, Herbert L., 4,408,746., Cl. 254-344.000.

Harreld, Donald R.: *See*—
Laske, Louis L.; and Harreld, Donald R., 4,408,643., Cl. 383-70.000.

Harris Corporation: *See*—
Bollinger, John G.; Nichols, Richard E.; and Delaruelle, Dale H., 4,408,483., Cl. 73-115.000.
Ports, Kenneth A.; and Harlow, Justin E., 4,409,686., Cl. 382-8.000.

Harris, Elbert E.: *See*—
Thorsett, Eugene D.; and Harris, Elbert E., 4,409,146., Cl. 260-239.30R.

Harris, Victor A. Exhaust brake valve unit. 4,408,627., Cl. 137-242.000.

Harris, William A., to Honeywell Inc. Interconnection of primary cells. 4,409,537., Cl. 320-7.000.

Harrison, Lynn: *See*—
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, 4,409,638., Cl. 361-152.000.

Harrison, Thomas B. Ski protective device. 4,409,287., Cl. 428-343.000.

Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., to Continental Group, Inc., The. Blow molding method. 4,409,161., Cl. 264-40.100.

Harsco Corporation: *See*—
D'Alessio, Michael S.; and Sandler, Stanley A., 4,408,431., Cl. 52-690.000.
D'Alessio, Michael S., 4,408,922., Cl. 403-12.000.

Hart, David: *See*—
Basford, Robert; Hart, David; Hawkins, David; Knight, David; and Sidey, Roger, 4,409,529., Cl. 318-653.000.

Harting, Stanley C.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Hartless, Ray L.: *See*—
Chandross, Edwin A.; and Hartless, Ray L., 4,409,318., Cl. 430-271.000.

Hartman, Marvis E.: *See*—
Dowbenko, Rostyslaw; Hartman, Marvis E.; and Hockswender, Thomas R., 4,409,376., Cl. 525-509.000.

Hartman, Paul R.; and Milam, Thomas B., to United Technologies Corporation. Mirror adjusting fixture. 4,408,832., Cl. 350-310.000.

Hartman, Seymour; and Brown, Timothy M., to Champion International Corporation. Method for scavenging aldehydes. 4,409,375., Cl. 525-505.000.

Hartmann, Albert: *See*—
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,409,209., Cl. 424-177.000.

Hartwig, Carl S. M., to Atlas Copco Aktiebolag. Vehicle. 4,409,525., Cl. 318-139.000.

Haruhiko, Masuda: *See*—
Takashi, Nogami; and Haruhiko, Masuda, 4,408,814., Cl. 339-59.00M.

Harvey Hubbell Incorporated: *See*—
Neuroth, David H., 4,409,431., Cl. 174-103.000.

Hashimoto, Michitaka; and Fukui, Koichiro, to Showa Aluminum Corporation. Heat pipe. 4,408,655., Cl. 165-104.270.

Hassall, Cedric H.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,409,391., Cl. 549-39.000.

Hata, Shun-ichi: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Hatch, Donald M.; and Larsen, Richard J., to Hitco. High temperature consolidation process. 4,409,048., Cl. 156-155.000.

Hatcher, Charles S.; and Smith, Kenneth E., to Phillips Petroleum Company. Apparatus for drawing yarn. 4,408,376., Cl. 28-245.000.

Hatsuoka, Nobuyasu: *See*—
Yamada, Yoshiro; Hatsuoka, Nobuyasu; and Ashida, Shinzo, 4,409,026., Cl. 75-124.000.

Hatta, Yoshio: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kano, Toshiji; and Hatta, Yoshio, 4,409,074., Cl. 204-98.000.

Hattori, Mitsuhiro: *See*—
Nakayama, Shozo; Suzuki, Shigeru; and Hattori, Mitsuhiro, 4,408,962., Cl. 417-269.000.

Hattori, Nobuoto: *See*—
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.

Hauck, Bobbie W.: *See*—
Wenger, Lavon G.; and Hauck, Bobbie W., 4,408,725., Cl. 241-260.100.

Hauk, Rolf: *See*—
Weber, Ralph; Rollinger, Bernt; Hauk, Rolf; Nagl, Michael; and Rinner, Bernhard, 4,409,023., Cl. 75-38.000.

Hauler, Peter; Heintz, Frieder; and Zabler, Erich, to Robert Bosch GmbH. Process and apparatus for operating an internal combustion engine. 4,408,589., Cl. 123-494.000.

Hauni-Werke Korber & Co. KG.: *See*—
Schumacher, Peter, 4,408,621., Cl. 131-282.000.

Haven, James T.; and Haven, Warren G. Dumping hopper. 4,408,946., Cl. 414-424.000.

Haven, Warren G.: *See*—
Haven, James T.; and Haven, Warren G., 4,408,946., Cl. 414-424.000.

Hawkins, David: *See*—
Basford, Robert; Hart, David; Hawkins, David; Knight, David; and Sidey, Roger, 4,409,529., Cl. 318-653.000.

Hay, Robert R.: *See*—
Camis, Thomas; Spencer, Paul R.; Schwiebert, Erwin H.; and Hay, Robert R., 4,408,865., Cl. 355-3.0CH.

Hayama, Yoshihiro; and Hosokawa, Yuukou, to Tokyo Shibaura Denki Kabushiki Kaisha. Coil Manufacturing apparatus. 4,408,639., Cl. 140-71.500.

Hayashi, Hiroshi; Kiyota, Takao; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. Dried, sterilized, gamma-globulin-fixed column and a process for preparing the same. 4,409,105., Cl. 210-679.000.

Hayashi, Nobuaki: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,409,313., Cl. 430-144.000.

Hayashi, Takayuki: *See*—
Hoshi, Yoshiyuki; and Hayashi, Takayuki, 4,409,156., Cl. 264-4.330.

Hayes, Thomas J. Road traffic actuated generator. 4,409,489., Cl. 290-1.00R.

Heap, James C., to Thrall Car Manufacturing Company. Center sill gondola car. 4,408,542., Cl. 105-406.00R.

Heatfield, Barry M.: *See*—
Jefferies, Steven R.; Gutmann, James L.; and Heatfield, Barry M., 4,409,332., Cl. 435-188.000.

Heath Farm Equipment: *See*—
Keller, Phillip D.; Urich, Oren D.; and Mahagan, Deroy E., 4,408,551., Cl. 111-85.000.

Heath, James H., to United Kingdom Atomic Energy Authority. Turbine flow meters. 4,408,498., Cl. 73-861.790.

Heaven, Malcolm D.: *See*—
Berth, Jorgen; Hansen, Erling; Heaven, Malcolm D.; and Petersen, Tommy, 4,409,177., Cl. 264-531.000.

Hecker, William C., to Chevron Research Company. Sulfur sorbent regeneration process. 4,409,123., Cl. 502-38.000.

Hecker, William C.: *See*—
Robinson, Richard C.; and Hecker, William C., 4,409,124., Cl. 502-5.000.

Heeger, Stephen E., to AMF Incorporated. Sequence controller with microprocessor. 4,409,649., Cl. 364-144.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Unsaturated polyesters containing dicyclopentadiene in the form of its esters and ethers. 4,409,360., Cl. 524-804.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Dicyclopentadiene modified polyesteramides containing endomethylenetetrahydrophthalyl functionality and process for preparing same. 4,409,371., Cl. 525-418.000.

Heimbach, Klaus-Jurgen; and Zultzke, Walter, to Leybold-Heraeus GmbH. Apparatus for regulating the evaporation rate of oxidizable substances in reactive vacuum deposition. 4,408,563., Cl. 118-692.000.

Heimberg, Manfred, to National Distillers and Chemical Corporation. Process for preparing high solids copolymer latices with low viscosity. 4,409,355., Cl. 524-458.000.

Heinicke, Ralph M., to Research Corporation of the University of Hawaii. Xeronine, a new alkaloid, useful in medical, food and industrial fields. 4,409,144., Cl. 260-236.500.

Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, to Hoechst Aktiengesellschaft. Pressure-resistant microcapsules with a polyamide shell and a polyurethane-polyurea inner mass and process for their manufacture. 4,409,201., Cl. 424-32.000.

Heinrich, Siegfried: *See*—
Stolzenbach, Heinrich; Heitzmann, Rudolf; and Heinrich, Siegfried, 4,409,340., Cl. 521-159.000.

Heintz, Frieder: *See*—
Hauler, Peter; Heintz, Frieder; and Zabler, Erich, 4,408,589., Cl. 123-494.000.

Heinz-Dieter Adomeit: *See*—
Adomeit, Heinz-Dieter; and Schulz, Volkmar, 4,408,802., Cl. 297-452.000.

Heinze, Gerhard: *See*—
Holzwarth, Friedrich; and Heinze, Gerhard, 4,409,046., Cl. 156-73.600.

Heitzmann, Rudolf: *See*—
Stolzenbach, Heinrich; Heitzmann, Rudolf; and Heinrich, Siegfried, 4,409,340., Cl. 521-159.000.

Hemperly, Richard E. Multiple selectable timer. 4,408,894., Cl. 368-93.000.

Henein, Nabil, to ITT Industries, Inc. Arrangement for assembling a working cylinder. 4,408,389., Cl. 29-715.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Wiemers, Norbert; and Albini, Italo, 4,409,373., Cl. 525-432.000.

Hens, Maurice: *See*—
Brewaeys, Luc; and Hens, Maurice, 4,408,693., Cl. 206-461.000.

Henzel, Richard P.: *See*—
Armour, Eugene A.; Henzel, Richard P.; and Mowrey, Rowland G., 4,409,315., Cl. 430-214.000.

Herberts GmbH: *See*—
Stolzenbach, Heinrich; Heitzmann, Rudolf; and Heinrich, Siegfried, 4,409,340., Cl. 521-159.000.

Herbstman, Sheldon, to Texaco Inc. Process of dehydrogenation of hydrocarbons. 4,409,417., Cl. 585-660.000.

Hermanns, Bernd; and Michalak, Stanislaw, to L. & C. Steinmuller GmbH. Heat storage mass for regenerative heat exchange. 4,408,659., Cl. 165-10.000.

Herndon, James A.; and Ask, Henry R., to United Technologies Corporation. Solid-state digital flight data recorder. 4,409,670., Cl. 364-900.000.

Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., to EC Erdolchemie GmbH; and Bayer Aktiengesellschaft. Process for the preparation of pure tert.-olefins. 4,409,421., Cl. 585-833.000.

Hettinger, Jr., William P.: *See*—
Johnson, Charles A.; Ward, Clifford; Moore, Howard F.; and Hettinger, Jr., William P., 4,409,092., Cl. 208-89.000.

Hewlett Packard Company: *See*—
Camis, Thomas; Spencer, Paul R.; Schwiebert, Erwin H.; and Hay, Robert R., 4,408,865., Cl. 355-3.0CH.
Sugihara, Noriyuki, 4,409,543., Cl. 324-57.00R.

Hey, Hansjorg: *See*—
Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, 4,409,400., Cl. 568-346.000.

Hi-Shear Corporation: *See*—
Williamson, Herman L., 4,408,936., Cl. 411-3.000.

Hickman, Mark R., to Vee Arc Corporation. Gated asynchronous carrier modulation. 4,409,535., Cl. 318-811.000.

Higgins, Thomas E., to Union Carbide Corporation. Controllably moisturized mold resistant cellulosic food casings. 4,409,251., Cl. 426-413.000.

Hildebrecht, Harold V., to Tewmotor Corporation. Apparatus for suspending a trunnion mounted axle assembly from a vehicle. 4,408,775., Cl. 280-95.00R.

Hill, Terry E.: *See*—
Williams, Harry S.; Yates, Jan B.; Reidy, John J.; Faccini, Ernest; Hill, Terry E.; and Shafley, William K., 4,408,405., Cl. 37-62.000.

Himmele, Walter; and Hoffmann, Werner, to BASF Aktiengesellschaft. Tert.-butoxybutanals, tert.-butoxybutanols, bis-tert.-butoxypentanals and bis-tert.-butoxypentanols. 4,409,402., Cl. 568-496.000.

Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, to Hitachi, Ltd. Composition for fire retardant urethane foam. 4,409,341., Cl. 521-162.000.

Hirai, Koichi: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,409,395., Cl. 560-179.000.

Hirai, Koji: *See*—
Kikuga, Toyoji; and Hirai, Koji, 4,409,374., Cl. 525-491.000.

Hiraki, Isao: *See*—
Oki, Takeo; and Hiraki, Isao, 4,409,072., Cl. 204-57.000.

Hirakura, Koji: *See*—
Ogata, Yoshihiro; Sakamoto, Koji; Takahashi, Harumi; and Hirakura, Koji, 4,408,863., Cl. 355-3.0TR.

Hirano, Koichi: *See*—
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,409,457., Cl. 219-69.00M.

Hirano, Tsumoru: *See*—
Yagihara, Morio; Hirano, Tsumoru; Mihayashi, Keiji; and Ozawa, Takashi, 4,409,320., Cl. 430-381.000.

Hirano, Yasuhiro: *See*—
Eto, Yoshizumi; and Hirano, Yasuhiro, 4,409,627., Cl. 360-38.100.

Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Kawamura, Osamu, to Nippon Piston Ring Co., Ltd. Sliding member for use in an internal combustion engine. 4,409,294., Cl. 428-553.000.

Hirata, Hitoshi: *See*—
Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, 4,409,436., Cl. 381-15.000.

Hirata, Yoshiaki: *See*—
Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.

Hirota, Hideo: *See*—
Nishino, Hiroshi; Suzuki, Masayuki; and Hirota, Hideo, 4,409,125., Cl. 502-180.000.

Hirshorn, Michael S.; Skalsky, Michael; van Berkum, Petrus A.; Holley, Loraine K.; and Money, David K., to Teletronics Pty, Limited. Porous pacemaker electrode tip. 4,408,604., Cl. 128-785.000.

Hisadome, Masanao, to Tokyo Shibaura Denki Kabushiki Kaisha. Electromagnetic contactor. 4,409,575., Cl. 335-160.000.

Hisatsune, Fumiyuki: *See*—
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,444., Cl. 200-144.00R.
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,445., Cl. 200-144.00R.

Hitachi Chemical Company, Ltd.: *See*—
Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, 4,409,508., Cl. 310-239.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Eto, Yoshizumi; and Hirano, Yasuhiro, 4,409,627., Cl. 360-38.100.

Hitachi Heating Appliances Co., Ltd.: *See*—
Oouchi, Keiji; Takoh, Isao; and Serizawa, Hisayuki, 4,409,452., Cl. 219-10.55E.

Hitachi, Ltd.: *See*—
Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, 4,409,559., Cl. 330-295.000.
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.
Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,408,840., Cl. 350-349.000.
Ito, Motoya; Fujimoto, Noboru; Takahashi, Noriyoshi; Watanabe, Masatoshi; and Yamashita, Seizi, 4,409,506., Cl. 310-166.000.
Koike, Hidemi; Sakudo, Noriyuki; Tokiguchi, Katsumi; and Kanomata, Ichiro, 4,409,520., Cl. 315-39.000.
Miyazaki, Kunio; Okosi, Yukio; Kumagai, Akira; and Suzuki, Hitoshi, 4,409,079., Cl. 204-192.00C.
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,409,313., Cl. 430-144.000.
Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, 4,409,508., Cl. 310-239.000.
Shiraishi, Hiroshi, 4,409,317., Cl. 430-270.000.
Takai, Hideo, 4,408,541., Cl. 105-199.00R.
Takeuchi, Seizi; and Matsuda, Shimpei, 4,409,129., Cl. 502-185.000.
Wada, Kenichi; and Yamada, Naoki, 4,409,654., Cl. 364-200.000.

Hitco: *See*—
Hatch, Donald M.; and Larsen, Richard J., 4,409,048., Cl. 156-155.000.
Spain, Raymond G., 4,409,288., Cl. 428-367.000.

Ho, Ting C.: *See*—
Gibson, William A.; and Ho, Ting C., 4,409,186., Cl. 422-131.000.

Hochstein, Peter A. Tire condition monitor converter. 4,409,586., Cl. 340-58.000.

Hockswender, Thomas R.: *See*—
Dowbenko, Rostyslaw; Hartman, Marvis E.; and Hockswender, Thomas R., 4,409,376., Cl. 525-509.000.

Hodakowski, Leonard E., to Union Carbide Corporation. O-(2-Aryl-3-oxo-1-cyclohexenyl) phosphates. 4,409,153., Cl. 260-946.000.

Hodge, Edward B., to International Minerals & Chemical Corp. 6' Esters of zearalanol. 4,409,392., Cl. 549-270.000.

Hoechst Aktiengesellschaft: *See*—
Buhr, Gerhard; Ruckert, Hans; and Stahlhofen, Paul, 4,409,314., Cl. 430-192.000.
Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, 4,409,396., Cl. 560-245.000.
Heinrich, Rudolf; Frensch, Heinz; and Albrecht, Konrad, 4,409,201., Cl. 424-32.000.
Michel, Wolfgang, 4,409,277., Cl. 428-156.000.
Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, 4,409,400., Cl. 568-346.000.
Rewitzer, Siegfried, 4,408,438., Cl. 53-438.000.
Wiezer, Hartmut; and Pfahler, Gerhard, 4,409,348., Cl. 524-100.000.

Hoechst, Lonnie D.: *See*—
Albright, Larry E.; and Hoechst, Lonnie D., 4,408,672., Cl. 180-89.140.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Davis, Larry; and Klein, Joseph T., 4,409,230., Cl. 424-267.000.
Martin, Lawrence L.; Worm, Manfred; and Crichlow, Charles A., 4,409,145., Cl. 260-239.0BD.
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., 4,409,229., Cl. 424-267.000.

Hoek, Bertil: *See*—
Bolmgren, Jan; Hoek, Bertil; and Nilsson, Kenth, 4,409,602., Cl. 346-140.00R.

Hoek, Cornelis: *See*—
Mutsers, Stanislaus M. P.; Hoek, Cornelis; and Wagemans, Gerardus M. C., 4,408,998., Cl. 23-293.00A.
Mutsers, Stanislaus M. P.; Hoek, Cornelis; and Wagemans, Gerardus M. C., 4,409,016., Cl. 71-59.000.

Hofer, Alan; and Yama, Frank M., to Pickering & Company, Inc. Miniature sounder with multi-part tuned cavities. 4,409,588., Cl. 340-384.00R.

Hoffman, Bertil: *See*—
Dahle, Orvar; Hoffman, Bertil; Nordvall, Jan; Siby, Sture; and Widehn, Ake, 4,408,496., Cl. 73-728.000.

Hoffmann-La Roche Inc.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,409,391., Cl. 549-39.000.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,409,390., Cl. 548-561.000.
Montavon, Marc; and Reiner, Roland, 4,409,387., Cl. 544-26.000.

Hoffmann, Werner: *See*—
Himmele, Walter; and Hoffmann, Werner, 4,409,402., Cl. 568-496.000.

Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Preheating glass batch. 4,409,011., Cl. 65-27.000.

Hokushin Electric Works, Ltd.: *See*—
Suzuki, Kazuie, 4,408,497., Cl. 73-861.170.

Holberger, Kenneth D.: *See*—
Wallach, Steven; Holberger, Kenneth D.; Keating, David L.; and Staudaher, Steven M., 4,409,655., Cl. 364-200.000.

Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Switch housing having recessed conductor terminals. 4,409,577., Cl. 335-202.000.

Holden, Graham: *See*—
Dey, Philip; Dunkley, Ronald; and Holden, Graham, 4,409,428., Cl. 174-43.000.

Holland, Ernest: *See*—
Darwood, Phillip I.; Holland, Ernest; Taylor, Peter M.; and Marley, Christopher, 4,408,399., Cl. 33-203.180.

Holland, Lawrence R., to United States of America, National Aeronautics and Space Administration. Apparatus and method for heating a material in a transparent ampoule. 4,408,658., Cl. 165-2.000.

Hollenbeck, Robert K.; and Rickard, Jimmy R., to General Electric Company. Start control arrangement for split phase induction motor. 4,409,532., Cl. 318-749.000.

Holley, Loraine K.: *See*—
Hirshorn, Michael S.; Skalsky, Michael; van Berkum, Petrus A.; Holley, Loraine K.; and Money, David K., 4,408,604., Cl. 128-785.000.

Hollwarth, Armin. Sailing vehicle. 4,408,772., Cl. 280-1.000.

Holman, James L., Jr.; and Neumeier, Leander A., to United States of America, Interior. Recovery of metals from grinding sludges. 4,409,020., Cl. 75-0.50B.

Holmberg, Krister; and Nilsson, Ingvar, to EKA AB. Detergent compositions stable to chlorine separation, and agents for producing same. 4,409,117., Cl. 252-99.000.

Holmes, Mark; and Frauenglass, Elliott, to Loctite Corporation. Anti-galling lubricative composition. 4,409,111., Cl. 252-30.000.

Holmes, Richard G.: *See*—
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., 4,408,558., Cl. 118-59.000.
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., 4,409,270., Cl. 428-63.000.

Holroyd, Eric; and Perkins, David J. B., to W & A Bates Limited. Reinforced structures. 4,409,059., Cl. 156-397.000.

Holt, James F., to United States of America, Air Force. Hole matrix vertical junction solar cell. 4,409,423., Cl. 136-255.000.

Holubka, Joseph W., to Ford Motor Company. Novel tertiary alcohol-diblocked diisocyanate urea urethane oligomers and coating compositions comprising same. 4,409,380., Cl. 528-45.000.

Holubka, Joseph W., to Ford Motor Company. Novel diblocked diisocyanate urea urethane oligomers and coating compositions comprising same. 4,409,381., Cl. 528-45.000.

Holzwarth, Friedrich; and Heinze, Gerhard, to SORTIMAT Creuz & Co. GmbH. Method of and an apparatus for producing disposable syringes and the disposable syringe produced. 4,409,046., Cl. 156-73.600.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Saitoh, Masaaki; and Kameoka, Michitada, 4,408,795., Cl. 296-218.000.
Sakaoka, Hiromu, 4,408,576., Cl. 123-52.0MB.
Shimoda, Nobuyoshi; and Hagino, Michiyoshi, 4,408,790., Cl. 293-122.000.
Takahashi, Fumitaka; and Gotoh, Hiroshi, 4,408,490., Cl. 73-497.000.

Honda, Nobuyasu: *See*—
Ikeda, Toshimitsu; Honda, Nobuyasu; and Nakano, Tetsuya, 4,409,312., Cl. 430-110.000.

Honeywell, Inc.: *See*—
Frimet, Stanley H.; and Meeks, Leighton A., 4,409,628., Cl. 360-73.000.
Harris, William A., 4,409,537., Cl. 320-7.000.
Kompelien, Arlon D., 4,409,552., Cl. 324-415.000.

Honjo, Yoshiaki, to Casio Computer Co., Ltd. Portable printing electronic calculator using multiple folded recording paper. 4,409,467., Cl. 235-58.0CF.

Hoover Universal, Inc.: *See*—
Bowman, James A., 4,408,799., Cl. 297-361.000.

Hoover, William J.: *See*—
Johnson, Lawrence A.; Hoover, William J.; and Deyoe, Charles W., 4,409,256., Cl. 426-598.000.

Hopkins, Walter: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Hopkins, Walter; Parker, Ellery; and Mackay, Donald A. M., 4,409,244., Cl. 426-5.000.

Horie, Fujio: *See*—
Takiguchi, Michitaka; and Horie, Fujio, 4,408,554., Cl. 112-302.000.

Horii, Masahiro: *See*—
Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.

Horiuchi, Kunio: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,408,752., Cl. 269-8.000.

Hornung, Helmut: *See*—
Edel, Hans J.; and Hornung, Helmut, 4,408,801., Cl. 297-433.000.

Horton Industries, Inc.: *See*—
Schilling, Hugh K.; and Raines, Charles D., 4,408,685., Cl. 192-85.00A.

Horvath, William. Automatic dispenser cap. 4,408,702., Cl. 222-212.000.

Horwath, John A.: *See*—
Albertson, Clarence E.; Horwath, John A.; and Lashua, Duane W., 4,409,298., Cl. 428-614.000.

Horyu, Sakae, to Canon Kabushiki Kaisha. Apparatus for indicating telephone line state. 4,409,437., Cl. 179-2.0DP.

Hoshi, Yoshiyuki; and Hayashi, Takayuki, to Fuji Photo Film Co., Ltd. Process for producing microcapsules. 4,409,156., Cl. 264-4.330.

Hoshino, Noriyuki: *See*—
Yano, Tadashi; and Hoshino, Noriyuki, 4,408,530., Cl. 101-415.100.

Hosiden Electronics Co., Ltd.: *See*—
Kamimura, Tomohiko, 4,409,442., Cl. 179-156.00R.

Hosokawa, Yuukou: *See*—
Hayama, Yoshihiro; and Hosokawa, Yuukou, 4,408,639., Cl. 140-71.500.

Hosonaga, Taketoshi: *See*—
Mizushima, Yoichi; Hosonaga, Taketoshi; Murakami, Takashi; and Ujiie, Nikio, 4,408,798., Cl. 297-326.000.

Hosoya, Masahiro: *See*—
Takano, Toshimasa; Hosoya, Masahiro; and Murakami, Reiji, 4,408,862., Cl. 355-3.0DD.

Hotta, Hisashi: *See*—
Kitamura, Yoichi; Hotta, Hisashi; and Yurita, Chikara, 4,409,456., Cl. 219-64.000.

Hotta, Yuji: *See*—
Sato, Ryosuke; Hotta, Yuji; and Matsuura, Katsumi, 4,409,323., Cl. 430-544.000.

Howard, Dennis D.: *See*—
Zalucha, Denis J.; Sexsmith, Frederick H.; and Howard, Dennis D., 4,409,383., Cl. 528-499.000.

Howarth, Robert F., to United States of America, Navy. Widerange photomultiplier circuit. 4,409,474., Cl. 250-207.000.

Howe, David G., to United States of America, Navy. Composite superconductors. 4,409,297., Cl. 428-614.000.

Howlett, Brian: *See*—
Cairns, Hugh; Greenhalgh, Peter M.; and Howlett, Brian, 4,409,237., Cl. 424-283.000.

HPS Corporation: *See*—
Peacock, Roy N., 4,408,634., Cl. 137-630.120.

Hsu, Edward C.: *See*—
Wagner, John P.; and Hsu, Edward C., 4,409,078., Cl. 204-188.000.

Huang, Tracy J.: *See*—
Haag, Werner O.; and Huang, Tracy J., 4,409,412., Cl. 585-454.000.

Huber, John H., to AMP Incorporated. Multi-piece connector and cover means. 4,408,823., Cl. 339-208.000.

Huckins, Charles M.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,409,577., Cl. 335-202.000.

Huebert, James P.: *See*—
Diel, Robert McK.; and Huebert, James P., 4,408,518., Cl. 91-31.000.

Huebner, Richard, to Harley-Davidson Motor Co., Inc. Split collar. 4,408,924., Cl. 403-23.000.

Hugh Steeper Limited: *See*—
Basford, Robert; Hart, David; Hawkins, David; Knight, David; and Sidey, Roger, 4,409,529., Cl. 318-653.000.

Hughes Aircraft Company: *See*—
Pastor, Ricardo C.; Chew, Remedios K.; and Gorre, Luisa E., 4,409,260., Cl. 427-82.000.
Wiener-Avnear, Eliezer, 4,408,839., Cl. 350-347.00R.

Huibers, Derk T. A.: *See*—
Snell, George J.; and Huibers, Derk T. A., 4,409,416., Cl. 585-635.000.

Hukuda, Minolu; and Watanabe, Tsutomu, to Ricoh Co., Ltd. Transfer-printing sheet separating system for electrophotographic copying apparatus. 4,408,861., Cl. 355-3.0TR.

Humphrey, Lawrence F., to Stauffer Chemical Company. Continuous high pressure process for preparing phenylphosphonous dichloride. 4,409,152., Cl. 260-543.00P.

Hunt, V. Bruce. Multipoint packet data communication system using random access and collision detection techniques. 4,409,592., Cl. 340-825.500.

Hurley, Thomas M., to Monarch Marking Systems, Inc. Holster for labeler. 4,408,706., Cl. 224-192.000.

Hurnaus, Rudolf; Griss, Gerhart; Sauter, Robert; Grell, Wolfgang; Kobinger, Walter; and Pichler, Ludwig, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Fused-ring amino-pyrazines as bradycardiac agents. 4,409,220., Cl. 424-250.000.

Husky Injection Molding Systems Inc.: *See*—
Brown, Paul, 4,408,981., Cl. 425-589.000.

Huster, Lothar: *See*—
Beckerle, Heinz; Huster, Lothar; and Zondler, Rolf, 4,409,352., Cl. 524-405.000.

Huston, Ernest L.: *See*—
Sandrock, Gary D.; Huston, Ernest L.; and Liu, James, 4,409,180., Cl. 420-455.000.

Hutten, Hans M.: *See*—
Eichler, Helmut; Vorhagen, Friedrich W.; and Hutten, Hans M., 4,409,614., Cl. 358-76.000.

Hutzenlaub, Armin S. P.; and Schmidt, Willi, to Fa. Erwin Kampf GmbH & Co. Metal strip stretching mill. 4,408,474., Cl. 72-205.000.

Hyland, Joseph; and Wetherell, Joseph J. Dynamic toy apparatus. 4,408,413., Cl. 46-241.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Multiband refrigerated display case having a top access opening. 4,408,465., Cl. 62-82.000.

Ichinohe, Shoji; and Kasahara, Katsusuke, to Shin-Etsu Chemical Co., Ltd. Method for the finishing treatment of fabric materials. 4,409,267., Cl. 427-387.000.

Ichisaka, Teruo: *See*—
Yamaguchi, Kenzo; Ichisaka, Teruo; and Ikegami, Tadao, 4,409,084., Cl. 204-257.000.

ICI Australia Limited: *See*—
Serban, Alexander; Bird, Graham J.; and Cross, Lindsay E., 4,409,017., Cl. 71-94.000.

Ideno, Shigeru: *See*—
Nakamura, Kenji; and Ideno, Shigeru, 4,409,597., Cl. 346-35.000.

Igashira, Toshihiko: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,408,592., Cl. 123-625.000.

Iida, Makoto: *See*—
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.

Iijima, Kazumi: *See*—
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.

Iijima, Tetsuya; and Takahashi, Seiichi, to Nissan Motor Co., Ltd. Control for automobile air conditioning system. 4,408,713., Cl. 236-49.000.

Iijima, Tokuzo; Samejima, Yasushi; Kano, Toshiji; and Hatta, Yoshio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for electrolysis of an aqueous alkali metal chloride solution. 4,409,074., Cl. 204-98.000.

Iijima, Toshifumi: *See*—
Onodera, Kaoru; Iijima, Toshifumi; and Fujimastu, Wataru, 4,409,321., Cl. 430-383.000.

Ike, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for scanning a laser beam including means for focusing a scale scanning beam and a read/write scanning beam on the same facet of a polygon scanning mirror. 4,408,826., Cl. 350-6.800.

Ikeda, Tokuzo: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,409,282., Cl. 428-219.000.

Ikeda, Toshimitsu; Honda, Nobuyasu; and Nakano, Tetsuya, to Mita Industrial Co. Ltd. Dry developer for electrostatic image with Al or Ti alkoxide. 4,409,312., Cl. 430-110.000.
Ikeda, Yugo: *See—*
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.
Ikegami, Tadao: *See—*
Yamaguchi, Kenzo; Ichisaka, Teruo; and Ikegami, Tadao, 4,409,084., Cl. 204-257.000.
Ikegami, Toshimasa, to Kabushiki Kaisha Suwa Seikosha. Correcting mechanism for hybrid display timepiece. 4,408,896., Cl. 368-185.000.
Ikezawa, Harumi: *See—*
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,409,395., Cl. 560-179.000.
Illinois Tool Works Inc.: *See—*
Graff, Henry W.; and Erickson, Lloyd A., 4,408,939., Cl. 411-112.000.
Imada, Akira: *See—*
Asai, Mitsuko; Shinagawa, Susumu; and Imada, Akira, 4,409,147., Cl. 260-245.20T.
Imaizumi, Taketo: *See—*
Enomoto, Hiromu; Mitono, Yoshiharu; Yasuda, Yasushi; Imaizumi, Taketo; and Ohta, Hiroshi, 4,409,495., Cl. 307-290.000.
Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, to Hitachi, Ltd. Liquid crystal compositions containing pleochroic anthraquinone dyes, liquid crystal devices containing the compositions, and the dyes. 4,408,840., Cl. 350-349.000.
Imperial Chemical Industries PLC: *See—*
Swerdlow, Martin S., 4,409,285., Cl. 428-332.000.
Imura, Toshinori; and Tominaga, Shinji, to Minolta Camera Kabushiki Kaisha. Automatic focus adjusting device for use in a camera. 4,408,855., Cl. 354-25.000.
Inaba, Masao; and Kashigi, Kazuo, to Nippon Electric Co., Ltd. Digital video effects system employing a chroma-key tracking technique. 4,409,618., Cl. 358-183.000.
Inagaki, Mitsuo; Sasaya, Hideaki; and Ito, Seitoku, to Nippon Soken, Inc. Rotary compressor. 4,408,968., Cl. 418-15.000.
Incremona, Joseph H., to Minnesota Mining and Manufacturing Company. Lithographic printing plate with oleophilic area of radiation exposed adduct of diazo resin and sulfonated polymer. 4,408,532., Cl. 101-456.000.
Indian Explosives Limited: *See—*
Bhattacharyya, Dhirendra N.; Seshan, Srinivasachari; Campbell, John S.; and Sen, Soumendranath, 4,409,044., Cl. 149-2.000.
Industrie Pirelli S.p.A.: *See—*
Gallizia, Achille, 4,408,980., Cl. 425-501.000.
Information International, Inc.: *See—*
Richards, John S.; and DePaoli, Alan G., 4,409,621., Cl. 358-260.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Bernardis, Francesco, 4,408,907., Cl. 400-124.000.
Ingle, William M.: *See—*
Darnell, Robert D.; and Ingle, William M., 4,409,195., Cl. 423-342.000.
Innes, Robert A.: *See—*
Swift, Harold E.; Innes, Robert A.; and Onopchenko, Anatoli, 4,409,399., Cl. 564-473.000.
Inoue, Eiichi: *See—*
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,409,308., Cl. 430-60.000.
Inoue, Hiroshi; and Tooyama, Nobuo, to Ricoh Company, Ltd. Liquid crystal display panels and process for their production. 4,409,268., Cl. 428-1.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,409,458., Cl. 219-69.00D.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. EDM Method and apparatus with the controlled supply of a liquid machining medium into the gap. 4,409,458., Cl. 219-69.00D.
Inoue, Shigeki: *See—*
Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, 4,409,559., Cl. 330-295.000.
Inoue, Takehisa: *See—*
Iwayama, Kazuyoshi; and Inoue, Takehisa, 4,409,413., Cl. 585-481.000.
Institut Francais du Petrole: *See—*
Cosyns, Jean; and Durand, Daniel, 4,409,410., Cl. 585-259.000.
Institut Vysokikh Temperatur Akademii Nauk SSSR: *See—*
Abramian, Evgeny A., 4,409,492., Cl. 307-108.000.
Institute of Technology Precision Electrical Discharge Works: *See—*
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,409,457., Cl. 219-69.00M.
Intel Corporation: *See—*
Bohr, Mark T.; Yu, Kenneth K.; Chwang, Ronald J. C.; and Berglund, C. Neil, 4,409,259., Cl. 427-38.000.
International Business Machines: *See—*
Wallace, Leonard J., 4,408,906., Cl. 400-104.000.
International Business Machines Corporation: *See—*
Applegate, Steven L.; and Molloy, James J., 4,408,908., Cl. 400-120.000.
Colacino, James J.; and Leone, Ronald A., 4,409,319., Cl. 430-296.000.
Dibble, Eric P.; and Lynch, Thomas E., 4,409,071., Cl. 204-15.000.
Dorler, Jack A.; and Mosley, Joseph M., 4,409,498., Cl. 307-454.000.
Malaviya, Shashi D., 4,409,673., Cl. 365-180.000.
International Harvester Co.: *See—*
Gladich, Radisko S., 4,408,684., Cl. 192-53.00G.
International Minerals & Chemical Corp.: *See—*
Hodge, Edward B., 4,409,392., Cl. 549-270.000.
International Paper Company: *See—*
Naugle, George H.; Gordon, Robert L.; and Pines, Richard J., 4,409,053., Cl. 156-287.000.
International Standard Electric Corporation: *See—*
Beckerle, Heinz; Huster, Lothar; and Zondler, Rolf, 4,409,352., Cl. 524-405.000.
Gerstle, Volker; Mauz, Gerhard; and Zondler, Rolf, 4,409,306., Cl. 430-28.000.
Graziani, Danio, 4,409,594., Cl. 343-399.000.
Internationale Patente Verwertungsgesellschaft m.b.H.: *See—*
Reumann, Franz, 4,409,581., Cl. 335-284.000.
Iowa State University Research Foundation, Inc.: *See—*
Winchip, Galen J., 4,408,509., Cl. 83-435.100.
Ishida, Tetsuhisa: *See—*
Yamamoto, Taizo; and Ishida, Tetsuhisa, 4,408,641., Cl. 141-82.000.
Ishida, Yasuo, to Takeda Chemical Industries, Ltd. Hexahydroisoindol derivatives, and their production and use. 4,409,018., Cl. 71-96.000.
Ishigaki, Tsuneo, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Solenoid actuator for electromagnetic valve. 4,409,580., Cl. 335-243.000.
Ishihara, Taketoshi: *See—*
Wada, Shinji; Oana, Yoshinori; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,408,847., Cl. 351-211.000.
Ishii, Hiroshi, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Method and apparatus for driving an ink jet printer head. 4,409,596., Cl. 346-1.100.
Ishii, Kenjiro: *See—*
Toriumi, Shiro; Ishii, Kenjiro; and Yamagishi, Seiichi, 4,408,732., Cl. 242-192.000.
Ishii, Tasuku. Fluid driven engine. 4,408,951., Cl. 415-36.000.
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Multilayer color photographic light-sensitive materials. 4,409,324., Cl. 430-546.000.
Italfarmaco S.p.A.: *See—*
Cremonesi, Pietro; and Sportoletti, Giancarlo, 4,409,103., Cl. 210-638.000.
Ito, Motoya; Fujimoto, Noboru; Takahashi, Noriyoshi; Watanabe, Masatoshi; and Yamashita, Seizi, to Hitachi, Ltd. Induction motor. 4,409,506., Cl. 310-166.000.
Ito, Seitoku: *See—*
Inagaki, Mitsuo; Sasaya, Hideaki; and Ito, Seitoku, 4,408,968., Cl. 418-15.000.
Ito, Shinji: *See—*
Araki, Ikuo; Kanazawa, Teruo; Ito, Shinji; and Sumikawa, Kenji, 4,408,534., Cl. 102-288.000.
Ito, Yosuke: *See—*
Umekawa, Osamu; Ito, Yosuke; and Katayama, Sakae, 4,409,353., Cl. 524-421.000.
ITT Industries, Inc.: *See—*
Henein, Nabil, 4,408,389., Cl. 29-715.000.
Luepertz, Hans-Henning, 4,408,457., Cl. 60-547.100.
Ivanov, Vasily A.: *See—*
Salikhov, Zufar G.; Ivanov, Vasily A.; Vyatchinov, Viktor P.; Maltsev, Vladimir I.; Grozdev, Sergei S.; and Khodov, Nikolai V., 4,409,101., Cl. 210-266.000.
Iwai, Hiroji; and Matsui, Hirotoshi, to Sharp Kabushiki Kaisha. Paper guide mechanism in a printer. 4,408,917., Cl. 400-637.200.
Iwamoto, Akito; and Sekizawa, Hidekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for inspecting average size of fundamental patterns. 4,408,883., Cl. 356-355.000.
Iwamoto, Yoshihiko: *See—*
Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.
Iwashita, Tomonori: *See—*
Fukahori, Hidehiko; Iwashita, Tomonori; and Nakamura, Katsunori, 4,408,859., Cl. 354-274.000.
Iwata, Minoru: *See—*
Sato, Tadao; Endo, Tadashi; Fukunaga, Osamu; and Iwata, Minoru, 4,409,193., Cl. 423-290.000.
Iwayama, Kazuyoshi; and Inoue, Takehisa, to Toray Industries, Incorporated. Conversion of xylenes containing ethyl benzene. 4,409,413., Cl. 585-481.000.
Jackson, Robert G.; and Yoon, Heeyoung, to Conoco Inc. Methane cold starter in alcohol fuel treatment and distribution method. 4,408,571., Cl. 123-3.000.
Jackson, Robert G.: *See—*
Yoon, Heeyoung; and Jackson, Robert G., 4,408,572., Cl. 123-3.000.
Jacobs, Jorn: *See—*
Schmalfeld, Jorg; Bruckner, Werner; Jacobs, Jorn; Greulich, H. S.; and Schlutter, A., 4,408,548., Cl. 110-347.000.
Jacquet, Bernard: *See—*
Gaetani, Quintino; Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, 4,409,379., Cl. 526-230.500.
Jacuzzi Inc.: *See—*
Cohen, Carlos; and Raab, Alfred, 4,408,721., Cl. 239-417.000.
Jaeger, Walter, to GX-Holding AG. Method for reproducing polychrome images. 4,409,610., Cl. 358-12.000.

Jagenberg Werke AG: *See*—
Dropczynski, Hartmut, 4,408,727., Cl. 242-56.00R.
Jahnke, Bernd, to BBC Brown, Boveri & Company, Limited. Process for the non-cracking energy beam welding of high temperature shaped parts. 4,409,462., Cl. 219-121.0ED.
Jahrstorfer, George W.: *See*—
Nasvytis, Pius J.; and Jahrstorfer, George W., 4,408,953., Cl. 415-62.000.
Jakob, Gert; Gansert, Willi; Goetzke, Siegfried; and Ruttkowski, Lothar, to Robert Bosch GmbH. Environmentally protected electronic network structure and housing combination. 4,409,641., Cl. 361-386.000.
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., to PLM Aktiebolag. Method for moulding an article from plastic material. 4,409,176., Cl. 264-527.000.
Jan, Gerald: *See*—
Lenoir, John; and Jan, Gerald, 4,409,143., Cl. 260-205.000.
Jansky, John: *See*—
Stofko, John, 4,409,170., Cl. 264-113.000.
Janssens, Werner J., to W. J. Janssens Industries (N.Z.) Limited. Edge banding means. 4,409,060., Cl. 156-497.000.
Japan Exlan Company Limited: *See*—
Takao, Seiji, 4,409,162., Cl. 264-41.000.
Jarvis, Henry F. Agricultural shares. 4,408,667., Cl. 172-722.000.
Jeans, Edward L., to Cadbury Schweppes PLC. Liquid dispensing valve. 4,408,701., Cl. 222-153.000.
Jefferies, Steven R.; Gutmann, James L.; and Heatfield, Barry M. Collagen-enzyme conjugates that exhibit no inflammatory response and method for making the same. 4,409,332., Cl. 435-188.000.
Jehring, Arnfried: *See*—
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Jehring, Arnfried; and Liebschner, Fritz, 4,408,529., Cl. 101-415.100.
Jelks, Edward C.; and Kerber, George L., to United States of America, Navy. Fabrication of submicron-wide lines with shadow depositions. 4,409,262., Cl. 427-99.000.
Jentzsch, Arndt: *See*—
Johne, Hans; Forster, Karl-Heinz; Jentzsch, Arndt; and Muller, Wolfgang, 4,408,528., Cl. 101-364.000.
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Jehring, Arnfried; and Liebschner, Fritz, 4,408,529., Cl. 101-415.100.
Jerabek, Bohumil. Chain saw. 4,408,393., Cl. 30-123.400.
Jeronimidis, Giorgio: *See*—
Chaplin, Christopher R.; Gordon, James E.; and Jeronimidis, Giorgio, 4,409,274., Cl. 428-112.000.
Jeruzal, Thomas M.; and Koski, Dennis G. Portable workbench. 4,408,642., Cl. 144-286.00A.
Jervis B. Webb Company: *See*—
Dehne, Clarence A., 4,408,540., Cl. 104-172.00B.
Jessee, Karen L.: *See*—
Clarady, Joseph F., Jr.; Jessee, Karen L.; and Bearden, Joe L., 4,408,881., Cl. 356-347.000.
Jeumont-Schneider Corporation: *See*—
Fromont, Jacques; and Plancon, Marcel, 4,408,470., Cl. 72-8.000.
Jimbo, Yoshihiro: *See*—
Kobayashi, Makoto; Yamamoto, Tetsuji; and Jimbo, Yoshihiro, 4,409,623., Cl. 358-261.000.
Jirkovsky, Ivo L., to American Home Products Corp. Pyrimido[1,6-a]indole derivatives. 4,409,224., Cl. 424-251.000.
Jobst Institute, Inc.: *See*—
Mummert, Thomas A., 4,408,599., Cl. 128-24.00R.
Jochym, Eric P., to General Electric Company. Blister-free direct bonding of metals to ceramics and metals. 4,409,278., Cl. 428-163.000.
Johannsmeier, Karl-Heinz; Stoft, Paul E.; and Larsen, Tor G., to Kasper Instruments, Inc. Apparatus for the automatic alignment of two superimposed objects, e.g. a semiconductor wafer and mask. 4,408,885., Cl. 356-401.000.
John, Leonard K. Graphite fibre violin. 4,408,516., Cl. 84-275.000.
John, Peter W. Process for enlargement of rock fractures. 4,408,663., Cl. 166-259.000.
John Wyeth and Brother Limited: *See*—
White, Alan C.; and Bradley, Gerald, 4,409,218., Cl. 424-248.550.
Johne, Hans; Forster, Karl-Heinz; Jentzsch, Arndt; and Muller, Wolfgang, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Printing equipment with screw controlled doctor blade. 4,408,528., Cl. 101-364.000.
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Jehring, Arnfried; and Liebschner, Fritz, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Plate clamping device. 4,408,529., Cl. 101-415.100.
Johnson, Charles A.; Ward, Clifford; Moore, Howard F.; and Hettinger, Jr., William P., to Ashland Oil, Inc. Combination process for upgrading oil products of coal, shale oil and crude oil to produce jet fuels, diesel fuels and gasoline. 4,409,092., Cl. 208-89.000.
Johnson & Johnson Baby Products Company: *See*—
Passafiume, Anthony; and Pieniak, Heinz A., 4,409,049., Cl. 156-164.000.
Johnson, Lawrence A.; Hoover, William J.; and Deyoe, Charles W., to Edlong Corporation, The. Soymilk process. 4,409,256., Cl. 426-598.000.
Johnson, Marvin M.; Nowack, Gerhard P.; and Kukes, Semyon, to Phillips Petroleum Company. Isomerization process. 4,409,418., Cl. 585-667.000.
Jolly, Walter R.: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,409,161., Cl. 264-40.100.
Jones, Thaddeus M., to Dresser Industries, Inc. Active voltage divider. 4,409,540., Cl. 323-369.000.
Joswig, Franz: *See*—
Bechthold, Paul; Joswig, Franz; and Lingenbach, Josef, 4,408,478., Cl. 73-24.000.
Jude Engineering, Inc.: *See*—
Christian, Robert F., 4,408,944., Cl. 414-216.000.
Wolff, Erland, 4,408,769., Cl. 277-105.000.
Jugan, Michael R.: *See*—
Nottingham, Lawrence D.; and Jugan, Michael R., 4,408,383., Cl. 29-453.000.
Jyojiki, Kasao: *See*—
Tokutomi, Seijiro; Nakamura, Kazuo; and Jyojiki, Kasao, 4,408,853., Cl. 354-25.000.
Kabushiki Kaisha Chuo Seisakusho: *See*—
Mizutani, Hiroshi, 4,409,461., Cl. 219-111.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Tabata, Junichi, 4,409,538., Cl. 320-11.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Mishima, Toshio, 4,408,512., Cl. 84-1.030.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Sugino, Morihiko; and Saura, Eiji, 4,409,284., Cl. 428-304.400.
Yamada, Yoshiro; Hatsuoka, Nobuyasu; and Ashida, Shinzo, 4,409,026., Cl. 75-124.000.
Kabushiki Kaisha Miyanaga: *See*—
Miyanaga, Masaaki, 4,408,935., Cl. 408-206.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Ikegami, Toshimasa, 4,408,896., Cl. 368-185.000.
Ishii, Hiroshi, 4,409,596., Cl. 346-1.100.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Nakayama, Shozo; Suzuki, Shigeru; and Hattori, Mitsuhiro, 4,408,962., Cl. 417-269.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Asai, Kiyokazu; Oshima, Yujiro; Takeuchi, Akihiro; and Tokoro, Hiroharu, 4,408,479., Cl. 73-35.000.
Kaczmarek, Lynn M.: *See*—
Sigel, Bernard; Semrow, Carolyn M.; Kolstedt, Mark W.; Arkans, Edward J.; and Kaczmarek, Lynn M., 4,408,692., Cl. 206-438.000.
Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. Diaphragm cells employing reticulate cathodes. 4,409,085., Cl. 204-257.000.
Kadota, Toshihiko: *See*—
Sawaki, Ryoichi; and Kadota, Toshihiko, 4,409,634., Cl. 360-137.000.
Kaeding, Warren W.: *See*—
Forbus, Nancy P.; and Kaeding, Warren W., 4,409,132., Cl. 502-62.000.
Kaiser, Gunter: *See*—
von Agris, Rudolf; Kaiser, Gunter; and Nysten, Bernhard, 4,409,052., Cl. 156-227.000.
Kako, Takuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Shaft sealing devices for hydraulic machines. 4,408,767., Cl. 277-27.000.
Kameoka, Michitada: *See*—
Saitoh, Masaaki; and Kameoka, Michitada, 4,408,795., Cl. 296-218.000.
Kameyama, Shuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a bipolar integrated circuit device with a self-alignment base contact. 4,408,388., Cl. 29-578.000.
Kamimura, Tomohiko, to Hosiden Electronics Co., Ltd. Headphone. 4,409,442., Cl. 179-156.00R.
Kaminaka, Nobuyuki: *See*—
Kanai, Kenji; Kaminaka, Nobuyuki; Nouchi, Norimoto; and Nomura, Noboru, 4,409,632., Cl. 360-123.000.
Kampe, Wolfgang: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,409,236., Cl. 424-275.000.
Kampf, Julian C.: *See*—
Profio, Mark V.; Libert, James T.; and Kampf, Julian C., 4,409,640., Cl. 361-197.000.
Kanai, Kenji; Kaminaka, Nobuyuki; Nouchi, Norimoto; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Magnetic head arrangement. 4,409,632., Cl. 360-123.000.
Kanazawa, Teruo: *See*—
Araki, Ikuo; Kanazawa, Teruo; Ito, Shinji; and Sumikawa, Kenji, 4,408,534., Cl. 102-288.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Fujiwara, Kazuaki; and Konishi, Akio, 4,409,350., Cl. 524-180.000.
Iijima, Tokuzo; Samejima, Yasushi; Kano, Toshiji; and Hatta, Yoshio, 4,409,074., Cl. 204-98.000.
Kaneko, Katumi: *See*—
Suzuki, Akira; Yoshikawa, Yukio; and Kaneko, Katumi, 4,408,856., Cl. 354-234.000.
Kanetsu Kogyo Kabushiki Kaisha: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,408,752., Cl. 269-8.000.
Kanno, Ken-ichi; Gatayama, Tetsuya; and Koyama, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Regeneration method of ion-selective electrode, and ion-selective electrode and ion-concentration analyzer containing means adapted to practice said method. 4,409,088., Cl. 204-402.000.
Kano, Toshiji: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kano, Toshiji; and Hatta, Yoshio, 4,409,074., Cl. 204-98.000.

Kanomata, Ichiro: *See—*
Koike, Hidemi; Sakudo, Noriyuki; Tokiguchi, Katsumi; and Kanomata, Ichiro, 4,409,520., Cl. 315-39.000.

Kantor, Judith A.: *See—*
Feller, William F.; Kantor, Judith A.; Chirikjian, Jack G.; and Phillips, Terence M., 4,409,200., Cl. 436-516.000.

Kaplan, Laurie M. Orthodontic appliance. 4,408,988., Cl. 433-3.000.

Karinsky, Viktor N.; Musienko, Viktor T.; and Glazunov, Sergei G. Granulation apparatus. 4,408,971., Cl. 425-8.000.

Karm, Robert, to Martel, Catala & Cie. Double layer forming fabrics for use in paper making machines. 4,408,637., Cl. 139-425.00A.

Karp, Arthur; and Biggs, Gary A., to Varian Associates, Inc. TWT Interaction circuit with broad ladder rungs. 4,409,518., Cl. 315-3.500.

Karp, Arthur, to Varian Associates, Inc. TWT Slow-wave structure assembled from three ladder-like slabs. 4,409,519., Cl. 315-3.500.

Karpenko, Anatole N., to Anchor/Darling Valve Company. Reheater isolation device and chemical connector. 4,408,636., Cl. 138-94.000.

Kasahara, Katsusuke: *See—*
Ichinohe, Shoji; and Kasahara, Katsusuke, 4,409,267., Cl. 427-387.000.

Kasai, Masanao: *See—*
Okano, Kazumi; Nishigaki, Yuji; and Kasai, Masanao, 4,409,310., Cl. 430-95.000.

Kashigi, Kazuo: *See—*
Inaba, Masao; and Kashigi, Kazuo, 4,409,618., Cl. 358-183.000.

Kasper Instruments, Inc.: *See—*
Johannsmeier, Karl-Heinz; Stoft, Paul E.; and Larsen, Tor G., 4,408,885., Cl. 356-401.000.

Kassel, James W.: *See—*
Andersen, Steven C.; Penkauskas, Thomas P.; Kassel, James W.; and Newcomer, Stephen O., 4,409,656., Cl. 364-200.000.

Kasser, Alexander, to Technopulp A.G. Kraft paper. 4,409,065., Cl. 162-9.000.

Kastl, Alfons: *See—*
Schirk, Gunter; and Kastl, Alfons, 4,408,891., Cl. 366-265.000.

Kasuga, Akira: *See—*
Mizuno, Chiaki; Tamai, Yasuo; and Kasuga, Akira, 4,409,299., Cl. 428-694.000.
Ogawa, Hiroshi; Kasuga, Akira; Tamai, Yasuo; and Yamada, Yasuyuki, 4,409,291., Cl. 428-425.900.

Kasuga, Muneo: *See—*
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.
Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, 4,408,870., Cl. 355-14.0SH.

Kataoka, Yoshiaki: *See—*
Namba, Mutsusuke; Suzue, Seisuke; Mizuno, Toshio; and Kataoka, Yoshiaki, 4,409,354., Cl. 524-431.000.

Katayama Chemical Works Co., Ltd.: *See—*
Umekawa, Osamu; Ito, Yosuke; and Katayama, Sakae, 4,409,353., Cl. 524-421.000.

Katayama, Sakae: *See—*
Umekawa, Osamu; Ito, Yosuke; and Katayama, Sakae, 4,409,353., Cl. 524-421.000.

Kato, Koji: *See—*
Kogo, Nobuhiko; Tsutsui, Yoshimitsu; Kato, Koji; and Kishigami, Hisao, 4,409,160., Cl. 264-40.100.

Kato, Wataru: *See—*
Tsukada, Kazuhiro; and Kato, Wataru, 4,409,233., Cl. 424-273.00R.

Kato, Yasuo: *See—*
Wada, Shinji; Oana, Yoshinori; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,408,847., Cl. 351-211.000.

Kato, Yoshiei; Nozaki, Tsutomu; and Nakanishi, Kyoji, to Kawasaki Steel Corporation. Top-and-bottom blown converter steel making process. 4,409,024., Cl. 75-60.000.

Katsuragi, Shigeo: *See—*
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.

Kaufman, Jack W.: *See—*
Blake, Joseph W., III; and Kaufman, Jack W., 4,408,603., Cl. 128-325.000.

Kawabata, Kohji: *See—*
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,214., Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,215., Cl. 424-246.000.

Kawabata, Takao, to Mitsubishi Denki Kabushiki Kaisha. Method of restarting induction motor and apparatus for carrying out the same. 4,409,533., Cl. 318-807.000.

Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, to Bristol-Myers Company. Antibiotic compound. 4,409,210., Cl. 424-177.000.

Kawai, Hisasi: *See—*
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,408,592., Cl. 123-625.000.

Kawamura, Osamu: *See—*
Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Kawamura, Osamu, 4,409,294., Cl. 428-553.000.

Kawamura, Takao; and Masazumi, Yoshida, to Minolta Camera Kabushiki Kaisha; Kawamura, Takao; and Kyoto Ceramic Co., Ltd. Photosensitive member. 4,409,311., Cl. 430-95.000.

Kawasaki Steel Corporation: *See—*
Kato, Yoshiei; Nozaki, Tsutomu; and Nakanishi, Kyoji, 4,409,024., Cl. 75-60.000.

Kayaba Kogyo Kabushiki-Kaisha: *See—*
Mochizuki, Norihiro; and Kugimiya, Fusayoshi, 4,408,964., Cl. 417-310.000.

Keane, John F.: *See—*
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Keating, David L.: *See—*
Wallach, Steven; Holberger, Kenneth D.; Keating, David L.; and Staudaher, Steven M., 4,409,655., Cl. 364-200.000.

Keller, Arnold, to Waldemar Link GmbH & Co. Vario-head endoprosthesis. 4,408,360., Cl. 3-1.913.

Keller, Phillip D.; Urich, Oren D.; and Mahagan, Deroy E., to Heath Farm Equipment. Row planter. 4,408,551., Cl. 111-85.000.

Keller, Robert C., to General Motors Corporation. Dual outlet engine exhaust system. 4,408,675., Cl. 180-296.000.

Keller, Teddy M., to United States of America, Navy. Synthesis and polymerization of phthalonitrile monomers containing multiple phenoxy and sulfone linkages. 4,409,382., Cl. 528-173.000.

Kelsey-Hayes Company: *See—*
Becker, James; and Neill, Daniel L., 4,409,663., Cl. 364-561.000.

Kendall Company, The: *See—*
Sigel, Bernard; Semrow, Carolyn M.; Kolstedt, Mark W.; Arkans, Edward J.; and Kaczmarek, Lynn M., 4,408,692., Cl. 206-438.000.
Toth, Michael R., 4,408,357., Cl. 2-114.000.

Kennecott Corporation: *See—*
Long, William D.; and Rottenkolber, Paul J., 4,408,959., Cl. 416-241.00B.

Kent, Preben, to Brunswick Corporation. High flow shroud check valve. 4,408,632., Cl. 137-516.290.

Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., to Monsanto Company. Attrition resistant metal/oxygen compositions and a process for their preparation. 4,409,127., Cl. 502-205.000.

Keppel, Robert A.: *See—*
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,409,133., Cl. 502-354.000.

Kerber, George L.: *See—*
Jelks, Edward C.; and Kerber, George L., 4,409,262., Cl. 427-99.000.

Kerbs, Brad J.; and Lanter, Kent J., to Ralston Purina Company. Feed dispenser. 4,408,565., Cl. 119-52.00R.

Kern, Eckhart: *See—*
Pfalzgraf, Manfred; Kern, Eckhart; and Collonia, Harald, 4,408,581., Cl. 123-339.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Bechthold, Paul; Joswig, Franz; and Lingenbach, Josef, 4,408,478., Cl. 73-24.000.
Besocke, Karl-Heinz; and Berger, Siegfried, 4,409,509., Cl. 310-317.000.

Kernforschungsanlange Julich Gesellschaft mit beschrankter Haftung: *See—*
Forster, Siegfried, 4,408,984., Cl. 431-354.000.
Luft, Harald, 4,409,069., Cl. 204-1.00T.

Kessick, Michael A., to Research Council of Alberta. Alkali recycle process for recovery of heavy oils and bitumens. 4,409,091., Cl. 208-11.0LE.

Kessis, Theodore A.: *See—*
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Ketteringham, Terence A.; Lewis, Dennis L.; and Mayley, David E., to Associated Electrical Industries Limited. Apparatus for forming a filament coil of figure of eight conformation. 4,408,378., Cl. 28-289.000.

Khodov, Nikolai V.: *See—*
Salikhov, Zufar G.; Ivanov, Vasily A.; Vyatchinov, Viktor P.; Maltsev, Vladimir I.; Grozdev, Sergei S.; and Khodov, Nikolai V., 4,409,101., Cl. 210-266.000.

Khyarm, Khyarmo E.: *See—*
Min, Mart V.; Parve, Toomas E.; Khyarm, Khyarmo E.; and Pungas, Toom A., 4,409,555., Cl. 328-14.000.

Kiener, Heinz: *See—*
Walter, Lothar; Ernst, Horst M.; Brandenstein, Manfred; Kiener, Heinz; and Friedrich, Wolfgang, 4,408,809., Cl. 308-187.100.

Kikuga, Toyoji; and Hirai, Koji, to Sumitomo Durez Company, Ltd. Color developer for pressure-sensitive copying paper. 4,409,374., Cl. 525-491.000.

Kikuno, Masayuki, to Sharp Kabushiki Kaisha. Wide screen LCD panel with electrical terminal connections. 4,408,836., Cl. 350-334.000.

Killian, Henry R. Rotary engine. 4,408,577., Cl. 123-55.0AA.

Kim, Hueng T., to B. F. Goodrich Company, The. Method and apparatus for extruding a cellular product. 4,409,165., Cl. 264-53.000.

Kimizuka, Yoshie: *See—*
Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.

Kimmel, David J.; and Lauterbach, John H. F., to AMP Incorporated. Electrical fuse and method of making same. 4,409,582., Cl. 337-231.000.

Kimura, Katsuhiko: *See*—
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Iris servo apparatus. 4,409,472., Cl. 250-201.000.

Kimura, Shigeru: *See*—
Kimura, Teiji; and Kimura, Shigeru, 4,408,372., Cl. 24-217.00R.

Kimura, Teiji; and Kimura, Shigeru, to Sony Corporation; and Nifco Inc. Coupler. 4,408,372., Cl. 24-217.00R.

Kimura, Yoshikazu: *See*—
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.

King, Russell W. Radioactive material dose computer. 4,409,488., Cl. 250-432.0PD.

Kingsley, William, to Xerox Corporation. Raster scanning apparatus. 4,409,624., Cl. 358-285.000.

Kiriseko, Tadashi, to Fujitsu Limited. Method for producing a bipolar transistor utilizing an oxidized semiconductor masking layer in conjunction with an anti-oxidation mask. 4,408,387., Cl. 29-576.00E.

Kirschbaum, Nathan; and Sclafani, Augustus, to Grumman Aerospace Corporation. Landing gear door mud guard. 4,408,736., Cl. 244-100.00R.

Kish, Arthur S., to Murray Corporation. Device for assembling a hose and fitting. 4,408,381., Cl. 29-237.000.

Kishigami, Hisao: *See*—
Kogo, Nobuhiko; Tsutsui, Yoshimitsu; Kato, Koji; and Kishigami, Hisao, 4,409,160., Cl. 264-40.100.

Kislov, Vladimir G.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.

Kitamoto, Tatsuji; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,409,281., Cl. 428-212.000.

Kitamura, Masuo: *See*—
Yoshikawa, Tsukasa; and Kitamura, Masuo, 4,408,697., Cl. 220-279.000.

Kitamura, Yoichi; Hotta, Hisashi; and Yurita, Chikara, to Toyo Seikan Kaisha, Ltd. Welded can and process for preparation thereof. 4,409,456., Cl. 219-64.000.

Kitao, Ikuo: *See*—
Wada, Shinji; Oana, Yoshinori; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,408,847., Cl. 351-211.000.

Kiyota, Takao: *See*—
Hayashi, Hiroshi; Kiyota, Takao; and Shibukawa, Mitsuru, 4,409,105., Cl. 210-679.000.

Kjoller, Hans O. S., to Telefonaktiebolaget L M Ericsson. Method and apparatus for inserting instructions in a control sequence in a stored program controlled telecommunications system. 4,409,651., Cl. 364-200.000.

Kleber, Peter, to Deutsche Forschungs- und Versuchsanstalt fur Luft. Apparatus for acceleration-free mounting of a body in a spacecraft. 4,408,740., Cl. 244-158.00R.

Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,409,230., Cl. 424-267.000.

Kleinewefers, Jaeggli AG: *See*—
Tschirner, Wolfgang, 4,408,362., Cl. 8-151.000.

Kleinknecht, Hans P.; Ham, William E.; and Meier, Heinrich, to RCA Corporation. Optical measurements of fine line parameters in integrated circuit processes. 4,408,884., Cl. 356-355.000.

Kleuskens, Engelina C.; Maessen, Johannes G. H.; and van de Mond, Theodorus J., to Stamicarbon, B.V. Catalyst reactivation. 4,409,122., Cl. 502-20.000.

Kline, Richard B., II: *See*—
Neumann, Leopold; and Kline, Richard B., II, 4,409,652., Cl. 364-200.000.
Neumann, Leopold; and Kline, Richard B., II, 4,409,669., Cl. 364-900.000.

Kloss, Henry E. Projection television tube and process for forming same. 4,409,515., Cl. 313-477.00R.

Knapp, Robert L., to American Seating Company. Office chairs. 4,408,800., Cl. 297-285.000.

Knecht, George W., to Midland-Ross Corporation. Terminator connector for shielded cables. 4,408,816., Cl. 339-143.00R.

Knecht, Heinz: *See*—
Meller, Theo; and Knecht, Heinz, 4,408,773., Cl. 280-611.000.

Knifton, John F.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,409,405., Cl. 568-902.000.

Knight, David: *See*—
Basford, Robert; Hart, David; Hawkins, David; Knight, David; and Sidey, Roger, 4,409,529., Cl. 318-653.000.

Knijnenburg, Johannus P. H.; and Verhoeven, Bernardus, to U.S. Philips Corporation. Gain compensated transistor amplifier. 4,409,558., Cl. 330-288.000.

Kobari, Katsuo; and Hachisuka, Yoshiaki, to Fanuc Ltd. Apparatus for preventing phase control mechanism malfunction. 4,409,648., Cl. 363-54.000.

Kobari, Sadami: *See*—
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.

Kobayashi, Hidetoshi: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,409,240., Cl. 424-319.000.

Kobayashi, Hisamine; and Miyashiro, Mutsumi, to Shikishima Tipton Mfg. Co., Ltd. Fully automatic barrel finishing machine. 4,408,417., Cl. 51-163.200.

Kobayashi, Hisashi; and Anderson, John E., to Union Carbide Corporation. Process for firing a furnace. 4,408,982., Cl. 431-10.000.

Kobayashi, Makoto; Yamamoto, Tetsuji; and Jimbo, Yoshihiro, to Nippon Telegraph & Telephone Public Corporation. Method and equipment for processing gray scale facsimile signal. 4,409,623., Cl. 358-261.000.

Kobayashi, Shigeru, to Nissan Motor Company, Ltd. Heating apparatus for motor vehicles. 4,408,714., Cl. 237-12.30C.

Kobinger, Walter: *See*—
Hurnaus, Rudolf; Griss, Gerhart; Sauter, Robert; Grell, Wolfgang; Kobinger, Walter; and Pichler, Ludwig, 4,409,220., Cl. 424-250.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,409,235., Cl. 424-273.00R.

Koblanski, John N., to Ocean Ecology Ltd. Ultrasound measuring instrument. 4,408,494., Cl. 73-646.000.

Kobylinski, Thaddeus P.: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,409,404., Cl. 568-902.000.

Koch, Hans: *See*—
Bruhwiler, Eduard; and Koch, Hans, 4,408,461., Cl. 60-737.000.

Kocks Technik GmbH & Co.: *See*—
Brauer, Hans; and Demny, Werner, 4,408,476., Cl. 72-229.000.

Koehler, Rudolph, to Noma Canada Ltd. Multiple outlet and cover therefor. 4,408,813., Cl. 339-38.000.

Koehring GmbH: *See*—
Kuhn, Hans; and Viecenz, Arno, 4,408,668., Cl. 173-139.000.

Kogo, Nobuhiko; Tsutsui, Yoshimitsu; Kato, Koji; and Kishigami, Hisao, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for controlling the thickness of a film product. 4,409,160., Cl. 264-40.100.

Kohashi, Takahiro: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,409,313., Cl. 430-144.000.

Kohler, Armin; Schuster, Herbert; and Renner, Rudi, to Bayer Aktiengesellschaft. Sealing agent and lubricant for medium-pressure and high-pressure autoclaves. 4,409,187., Cl. 422-135.000.

Kohler Co.: *See*—
Rozek, Roy J., 4,408,361., Cl. 4-331.000.

Kohno, Mitsuo: *See*—
Matsuda, Kazuo; Kohno, Mitsuo; and Doi, Yoshinao, 4,409,339., Cl. 521-143.000.

Koike, Hidemi; Sakudo, Noriyuki; Tokiguchi, Katsumi; and Kanomata, Ichiro, to Hitachi, Ltd. Microwave discharge ion source. 4,409,520., Cl. 315-39.000.

Kojima, Hiroaki, to Minolta Camera Kabushiki Kaisha. Control system for electrostatic recording apparatus. 4,408,871., Cl. 355-14.00R.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Sakaguchi, Haruo; Seki, Norio; Yamamoto, Shu; and Wakabayashi, Hiroharu, 4,408,831., Cl. 350-269.000.

Kolbesen, Bernd, to Siemens Aktiengesellschaft. Method for cutting a semiconductor crystal into wafers. 4,409,075., Cl. 204-129.300.

Kolouch, Robert J.; and Michel, Rudolph H., to Du Pont de Nemours, E. I., and Company. Process for extruding a modified high molecular weight poly(ethylene terephthalate) resin. 4,409,167., Cl. 264-102.000.

Kolstedt, Mark W.: *See*—
Sigel, Bernard; Semrow, Carolyn M.; Kolstedt, Mark W.; Arkans, Edward J.; and Kaczmarek, Lynn M., 4,408,692., Cl. 206-438.000.

Komatsu, Akitoshi: *See*—
Okamura, Yuichi; and Komatsu, Akitoshi, 4,408,531., Cl. 101-415.100.

Kompelien, Arlon D., to Honeywell Inc. Cyclic means with magnetic latch for checking switch integrity. 4,409,552., Cl. 324-415.000.

Kondo, Atsushige; and Kondo, Masakazu. Apparatus for automatically producing comforters. 4,408,552., Cl. 112-119.000.

Kondo, Masakazu: *See*—
Kondo, Atsushige; and Kondo, Masakazu, 4,408,552., Cl. 112-119.000.

Konishi, Akio: *See*—
Fujiwara, Kazuaki; and Konishi, Akio, 4,409,350., Cl. 524-180.000.

Konishi, Masataka: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,409,210., Cl. 424-177.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Ezaki, Atsuo; and Murakami, Takeshi, 4,409,322., Cl. 430-523.000.
Fujii, Yozo; and Shiozawa, Takao, 4,408,867., Cl. 355-8.000.
Onodera, Kaoru; Iijima, Toshifumi; and Fujimastu, Wataru, 4,409,321., Cl. 430-383.000.
Sato, Ryosuke; Hotta, Yuji; and Matsuura, Katsumi, 4,409,323., Cl. 430-544.000.

Konther-Chamorro, Siegfried: *See*—
Konther, Siegfried; and Konther-Chamorro, Siegfried, 4,408,578., Cl. 123-56.00R.

Konther, Siegfried; and Konther-Chamorro, Siegfried. Piston engine as a combustion engine or as a compressor with opposed cylinders. 4,408,578., Cl. 123-56.00R.
Kontsov, Jury M.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.
Koon, Norman C., to United States of America, Navy. Amorphous transition metal-lanthanide alloys. 4,409,043., Cl. 148-403.000.
Koop, Hermann: *See*—
Bartholdsten, Dieter; Koop, Hermann; Schrode, Erhard; and Zielasek, Adelbert, 4,409,169., Cl. 264-107.000.
Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,409,235., Cl. 424-273.00R.
Korb, George P. Hanger for rectangular-section downspouts. 4,408,742., Cl. 248-74.00R.
Koreicho, Wladimir, to Societe Anonyme de Telecommunications. System for guiding a missile by light beam. 4,408,734., Cl. 244-3.130.
Korf-Stahl AG: *See*—
Weber, Ralph; Rollinger, Bernt; Hauk, Rolf; Nagl, Michael; and Rinner, Bernhard, 4,409,023., Cl. 75-38.000.
Koski, Dennis G.: *See*—
Jeruzal, Thomas M.; and Koski, Dennis G., 4,408,642., Cl. 144-286.00A.
Kossoff, George; and Robinson, David E., to Commonwealth of Australia, The. Signal processing equipment for ultrasonic visualization. 4,408,492., Cl. 73-631.000.
Kosuda, Toru; Takeuchi, Yasuhiro; Matsubara, Noboru; and Takizawa, Masaaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic valve lift device. 4,408,580., Cl. 123-90.160.
Koval, Ivan A.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.
Kowal, Wieslaw M.: *See*—
Skinner, Geoffrey F.; and Kowal, Wieslaw M., 4,409,196., Cl. 423-359.000.
Koyama, Masao: *See*—
Kanno, Ken-ichi; Gatayama, Tetsuya; and Koyama, Masao, 4,409,088., Cl. 204-402.000.
Kozaki, Syuichi; Funada, Fumiaki; and Minezaki, Shigehiro, to Sharp Kabushiki Kaisha. Antireflection, liquid crystal, electrode and nonconductive layer. 4,408,837., Cl. 350-336.000.
Krabetz, Richard; Merger, Franz; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Oxidation catalyst, especially for the preparation of methacrylic acid by gas phase oxidation of methacrolein. 4,409,128., Cl. 502-211.000.
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, to BASF Aktiengesellschaft. Copper complexes. 4,409,358., Cl. 524-547.000.
Kralik, Andrew J.: *See*—
Di Marco, Bernard; and Kralik, Andrew J., 4,409,573., Cl. 335-16.000.
Kramer, George H.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.
Kraus, Charles E., to Excelermatic Inc. Traction roller transmission. 4,408,502., Cl. 74-789.000.
Kraus, Charles E., to Excelermatic Inc. Traction roller transmission. 4,408,503., Cl. 74-798.000.
Kraus, Mark G., to Westinghouse Electric Corp. Electrical power system with fault tolerant control unit. 4,409,635., Cl. 361-62.000.
Krause, Helmfried; Wobbermin, Hubertus; and Geigle, Edgar, deceased (by Geigle, Brigitte, legal representative), to Degussa Aktiengesellschaft. Safety device for packagings which contain hydrogen emitting pyrophoric metallic catalysts. 4,409,185., Cl. 422-113.000.
Krautwurst, John. Dismountable furniture. 4,408,812., Cl. 312-256.000.
Kreibich, Willard H.: *See*—
Gilleo, Kenneth B.; and Kreibich, Willard H., 4,409,264., Cl. 427-265.000.
Kreinik, Stephen: *See*—
McMann, Renville H., Jr.; Kreinik, Stephen; and Novack, Martin M., 4,409,615., Cl. 358-111.000.
Krishnakumar, Suppayan M.: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,409,161., Cl. 264-40.100.
Kubler, Eberhard, to Hafele KG. Fitting for connecting two vertically abutting bodies of furniture. 4,408,923., Cl. 403-20.000.
Kubler, Hermann: *See*—
Bauer, Karl; Dammann, Peter; Kubler, Hermann; and Lorenz, Hellmut, 4,408,448., Cl. 57-336.000.
Kubota Ltd.: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,409,025., Cl. 420-584.000.
Kubota, Minoru: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; Fujimoto, Tsuneo; and Kubota, Minoru, 4,409,197., Cl. 423-415.00P.
Kudo, Ichiro: *See*—
Yabuhara, Hideo; and Kudo, Ichiro, 4,408,584., Cl. 123-440.000.
Kugimiya, Fusayoshi: *See*—
Mochizuki, Norihiro; and Kugimiya, Fusayoshi, 4,408,964., Cl. 417-310.000.
Kuhl, Henry Y. Article washing means with movable spray heads. 4,408,625., Cl. 134-144.000.
Kuhn, Dieter; Rach, Heinz-Dieter; Frerichs, Udo; and Pieper, Henner, to Continental Gummi-Werke Aktiengesellschaft. Vehicle wheel. 4,408,647., Cl. 152-330.0RF.
Kuhn, Hans; and Viecenz, Arno, to Koehring GmbH. Impact transfer device for power rams. 4,408,668., Cl. 173-139.000.
Kukes, Semyon: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; and Kukes, Semyon, 4,409,418., Cl. 585-667.000.
Kulkarni, Satish V.; and Stone, Richard G. Rimmed and edge thickened Stodola shaped flywheel. 4,408,500., Cl. 74-572.000.
Kumagai, Akira: *See*—
Miyazaki, Kunio; Okosi, Yukio; Kumagai, Akira; and Suzuki, Hitoshi, 4,409,079., Cl. 204-192.00C.
Kumasaka, Hideo: *See*—
Tanimura, Yusaburo; and Kumasaka, Hideo, 4,409,359., Cl. 524-575.000.
Kummer, Werner: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,409,235., Cl. 424-273.00R.
Kummerling, Rolf; Pe[illegible]obert; Pentzien, Thomas; and Papierok, Karl-Heinz, to Man[illegible]aus Aktiengesellschaft. Adjustable press tool. 4,408,477., Cl. [illegible].20.
Kuntz, Raymond: *See*—
Combes, Gilles; and [illegible]z, Raymond, 4,408,892., Cl. 366-337.000.
Kuo, Charles Y., to CTS Corporation. Process for air firing oxidizable conductors. 4,409,261., Cl. 427-96.000.
Kurafuji, Setsuo; and Tanimoto, Kazuo, to Fujitsu Limited. Static memory circuit. 4,409,679., Cl. 365-227.000.
Kuraray Co., Ltd.: *See*—
Mori, Fumio; and Omura, Yoshiaki, 4,409,238., Cl. 424-304.000.
Takamatsu, Hideo; and Minatono, Shobu, 4,409,056., Cl. 156-334.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,409,240., Cl. 424-319.000.
Kurihara, Hiroshi, to Fujitsu Limited. Phase correction circuit employing bandpass filters. 4,409,562., Cl. 331-1.00A.
Kurozu, Shinichi, to Sumitomo Heavy Industries, Ltd. Method of producing low-sulfur, reduced, iron ore pellets. 4,409,022., Cl. 75-36.000.
Kurzrock, John W.; and Tramm, Peter C., to General Motors Corporation. Supersonic blasting. 4,408,957., Cl. 416-237.000.
Kusano, Takuo; Masuda, Kouichi; and Namba, Masatoshi, to Nippon Light Metal Co., Ltd. Method of producing an aluminum wheel rim. 4,408,379., Cl. 29-159.100.
Kusche, David W., to Brunswick Corporation. Induction system for a two-cycle engine. 4,408,579., Cl. 123-73.00V.
Kuschel, Georg; and Reinhardt, Hartmut. Electrode arrangement for electrostatic deflection system. 4,409,487., Cl. 250-398.000.
Kusumgar, Rajal M.: *See*—
Froix, Michael F.; and Kusumgar, Rajal M., 4,409,370., Cl. 525-414.000.
Kuwata, Mitsuo: *See*—
Sakiyama, Kazuo; Kuwata, Mitsuo; and Oshiumi, Masaru, 4,409,077., Cl. 204-159.150.
Kyoto Ceramic Co., Ltd.: *See*—
Kawamura, Takao; and Masazumi, Yoshida, 4,409,311., Cl. 430-95.000.
L. & C. Steinmuller GmbH: *See*—
Hermanns, Bernd; and Michalak, Stanislaw, 4,408,659., Cl. 165-10.000.
Labatt Brewing Company Limited: *See*—
Stewart, Graham G.; Goring, Thomas E.; and Russell, Ingeborg, 4,409,246., Cl. 426-16.000.
Labelle, Henri M. R. Mounting assembly for a folding closure. 4,408,369., Cl. 16-102.000.
Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,409,242., Cl. 424-326.000.
Labrum, Ervin D. Color correction adapter for photographic enlargers. 4,408,873., Cl. 355-36.000.
Lafon, Louis, to Laboratoire L. Lafon. 4-Phenoxy-3-hydroxybutyramidoxime derivatives. 4,409,242., Cl. 424-326.000.
Lafont, Larry J., to Conoco Inc. Valve modification for fluid pump valves. 4,408,629., Cl. 137-329.040.
Lagarde, Robert; and Vrisakis, Georges, to Rhone-Poulenc Industries. Organosilicic elastomers reinforced with improved precipitated silica particulates. 4,409,356., Cl. 524-492.000.
Laigle, Jean-Claude: *See*—
Combourieu, Michel; Laigle, Jean-Claude; and Busch, Norbert, 4,409,221., Cl. 424-250.000.
Lamarque, Etienne: *See*—
Deffayet, Jean; and Lamarque, Etienne, 4,408,538., Cl. 102-522.000.
Landau, Adela, to Macdermid Incorporated. Adhesion promoter for printed circuits. 4,409,037., Cl. 148-6.14R.
Lane Company, Inc., The: *See*—
Mizelle, Ned W., 4,408,796., Cl. 297-85.000.

Lang, Gunter: *See*—
Ziegenhorn, Joachim; Bartl, Knut; Roder, Albert; Lang, Gunter; Mollering, Hans; and Nagele, Ulrich, 4,409,328., Cl. 435-25.000.

Lang, Gunther; and Wajaroff, Theodor, to Wella Aktiengesellschaft. Means for the aftertreatment of permanently deformed hair. 4,409,204., Cl. 424-70.000.

Lange, Peter M.: *See*—
Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., 4,409,421., Cl. 585-833.000.

Langer, Arthur W., Jr.; Doyle, Gerald; Burkhardt, Terry J.; and Looney, Ralph W., to Exxon Research and Engineering Co. Two stage olefin wax process. 4,409,409., Cl. 585-255.000.

Langer, Arthur W., Jr., to Exxon Research and Engineering Co. Preparation of linear olefin products. 4,409,414., Cl. 585-524.000.

Lanter, Kent J.: *See*—
Kerbs, Brad J.; and Lanter, Kent J., 4,408,565., Cl. 119-52.00R.

Larker, Hans; and Tegman, Ragnar, to ASEA Aktiebolag. Container for enclosing radioactive waste and a method for treating waste enclosed in the container. 4,409,029., Cl. 419-10.000.

Larsen, Richard J.: *See*—
Hatch, Donald M.; and Larsen, Richard J., 4,409,048., Cl. 156-155.000.

Larsen, Tor G.: *See*—
Johannsmeier, Karl-Heinz; Stoft, Paul E.; and Larsen, Tor G., 4,408,885., Cl. 356-401.000.

Larsson, Lars G.: *See*—
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,409,176., Cl. 264-527.000.

Lashua, Duane W.: *See*—
Albertson, Clarence E.; Horwath, John A.; and Lashua, Duane W., 4,409,298., Cl. 428-614.000.

Laske, Louis L.; and Harreld, Donald R., to Vonco Products, Inc. Plastic bags having a pressure resistant closure. 4,408,643., Cl. 383-70.000.

Laskey, Ben G. Press loader. 4,408,950., Cl. 414-749.000.

LaSpesa, Richard E.: *See*—
Ciesiel, Allen R.; LaSpesa, Richard E.; and Zolavvar, Ruperto B., 4,408,914., Cl. 400-208.000.

Last, Anthony J. Sonic liquid atomizer. 4,408,719., Cl. 239-102.000.

Lat, Geronimo E.: *See*—
Martinelli, Lawrence R.; and Lat, Geronimo E., 4,409,276., Cl. 428-142.000.

Latimer, John P., to Deepsea Ventures, Inc. Pivotable articulated support shoe for hydraulic nozzle. 4,408,404., Cl. 37-58.000.

Latos, Edwin J.; and Payne, John C., to UOP Inc. Corrosion inhibitors. 4,409,121., Cl. 252-389.00A.

Lautensleger, Richard W.; Bingham, George R.; and Trepanier, Peter J., to Armco Inc. Roof construction with stabilized Z-purlins. 4,408,423., Cl. 52-90.000.

Lauterbach, John H. F.: *See*—
Kimmel, David J.; and Lauterbach, John H. F., 4,409,582., Cl. 337-231.000.

Lawson, Charles L. Sod handling apparatus. 4,408,666., Cl. 172-19.000.

Lawson, John A.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.

Laybourne, Bernard D., to Chandler Evans, Inc. Jet pump with integral pressure regulator. 4,408,961., Cl. 417-189.000.

Layfield, James D., to Baker Perkins Inc. Centrifugal pelletizers. 4,408,972., Cl. 425-8.000.

Lear Siegler, Inc.: *See*—
Bassoff, Arthur B., 4,408,473., Cl. 72-108.000.

Leavitt, Richard A.: *See*—
Lehle, Fredric R.; Maine, James W.; Grossman, David; Leavitt, Richard A.; and Putnam, Alan R., 4,408,414., Cl. 47-1.00R.

Leblanc, Raymond F.; and Cummins, William T., to Teledyne Industries Inc. Shock cell product. 4,408,931., Cl. 405-213.000.

Lederman, Albert, to MSI Electronics Inc. Mercury-probe apparatus. 4,409,547., Cl. 324-158.00P.

Ledley, Robert S., to Georgetown University. Digital dental system and method. 4,409,616., Cl. 358-111.000.

Lee, Emerson H.: *See*—
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,409,127., Cl. 502-205.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,409,133., Cl. 502-354.000.

Lee, Garland G., to General Electric Company. Compositions comprising thermoplastic resin and long chained fatty acid. 4,409,351., Cl. 524-322.000.

Lee, James K., to Eastman Kodak Company. Electromagnetic actuator having a compliant armature. 4,408,858., Cl. 354-234.000.

Lee, Norman J., to Matburn (Holdings) Limited. Hydraulic control valve mechanism. 4,408,633., Cl. 137-596.200.

Legros, Andre; and Chalesle, Andre, to Regie Nationale des Usines Renault. Engine vibration filtration system. 4,408,785., Cl. 285-49.000.

Lehle, Fredric R.; Maine, James W.; Grossman, David; Leavitt, Richard A.; and Putnam, Alan R., to Board of Trustees operating Michigan State University. Detection apparatus and method of use. 4,408,414., Cl. 47-1.00R.

Lehnhardt, William F.; and Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Heat-gelling and foam-stabilizing enzymatically modified vegetable isolates. 4,409,248., Cl. 426-46.000.

Leiber, Heinz, to Robert Bosch GmbH. Speed-controlled servo-assisted steering apparatus. 4,408,673., Cl. 180-141.000.

Lelental, Mark; Rasch, Arthur A.; and Sullivan, David P., to Eastman Kodak Company. Electrically active inorganic interlayer for electrically activatable recording. 4,409,307., Cl. 430-31.000.

Lembke, Andreas: *See*—
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,409,245., Cl. 426-9.000.

Lenahan, Terrence A.: *See*—
Aloisio, Charles J., Jr.; Lenahan, Terrence A.; Smith, James V., Jr.; and Taylor, Carl R., 4,409,263., Cl. 427-163.000.

Lenderking, Bruce N.: *See*—
Couch, Robert D.; and Lenderking, Bruce N., 4,408,495., Cl. 73-655.000.

Le Noane, Georges E.; and Nonclercq, Bernard G. Optical fibre submarine cable. 4,408,828., Cl. 350-96.230.

Lenoir, John; and Jan, Gerald, to Ciba-Geigy AG. Monoazo dyes containing phosphamic acid diester groups. 4,409,143., Cl. 260-205.000.

Lenski, Ralph; Peiler, Rolf W.; and Pauli, Klaus H., to Deere & Company. Conveyor arrangement for a combine harvester. 4,408,947., Cl. 414-526.000.

Lentz, Joe B. Electronic signal simulation device. 4,409,554., Cl. 328-14.000.

Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiski Fabrik Produktionsaktieselskab): *See*—
Arrigoni-Martelli, Edoardo, 4,409,222., Cl. 424-251.000.

Leon, Gonzalo S.; Fraize, John E.; and Fortier, Richard C., to Cabot Corporation. Method of densifying powders. 4,409,171., Cl. 264-120.000.

Leone, Ronald A.: *See*—
Colacino, James J.; and Leone, Ronald A., 4,409,319., Cl. 430-296.000.

Leone, Sam: *See*—
Bloom, Hanley D.; Bloom, Stanley; Perry, Fred E.; and Leone, Sam, 4,408,407., Cl. 40-607.000.

Leonov, Ivan A.; Smirnov, Boris V.; Mashinin, Vladimir V.; and Sharovatov, Viktor I. Orthocyclic coil winding machine. 4,408,726., Cl. 242-7.090.

Lepesant, Jean P.; and Tantot, Georges, to Societe IMAJE. High stability printing liquid, intended more particularly for printing by ink jet. 4,409,039., Cl. 106-20.000.

LeRoy, Charles F., to UOP Inc. Simulated moving bed separation process for high viscosity feed streams. 4,409,033., Cl. 127-46.200.

Le Stang, Jean-Claude; and Thomin, Georges, to Centre National d'Etudes Spatiales. Method and device for the transmission of electric power between parts turning at low speed. 4,409,493., Cl. 307-132.00R.

LeSuer, William M., to Lubrizol Corporation, The. Combinations of hydroxy amines and carboxylic dispersants as fuel additives. 4,409,000., Cl. 44-70.000.

Lesueur, Claude: *See*—
Sigwald, Jacques; and Lesueur, Claude, 4,408,451., Cl. 60-322.000.

Letuan, Phac: *See*—
Dahan, Pierre-Louis; and Letuan, Phac, 4,409,583., Cl. 340-22.000.

Leung, Danton K.; and Singh, Prithipal, to Syva Company. Valproate conjugation using dicarbonyls. 4,409,325., Cl. 435-7.000.

Leupold & Stevens, Inc.: *See*—
Gibson, Dale E., 4,408,842., Cl. 350-560.000.

Levenspiel, Octave; and Chan, Riley T. Countercurrent heat exchanger for two streams of solids using heat pipes. 4,408,656., Cl. 165-1.000.

Lever, Clyde J., Jr.: *See*—
Brown, Robert J.; and Lever, Clyde J., Jr., 4,408,443., Cl. 57-204.000.

Levine, Michael R. Thermostat with adaptive operating cycle. 4,408,711., Cl. 236-11.000.

Lewis, Dennis L.: *See*—
Ketteringham, Terence A.; Lewis, Dennis L.; and Mayley, David E., 4,408,378., Cl. 28-289.000.

Lewis, Philip C., to Southwestern Pipe, Inc. Integral fence post and cap. 4,408,748., Cl. 256-11.000.

Ley, Gregor: *See*—
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,409,358., Cl. 524-547.000.

Leybold Heraeus GmbH: *See*—
Forth, Hans-Joachim, 4,408,469., Cl. 62-514.00R.
Heimbach, Klaus-Jurgen; and Zultzke, Walter, 4,408,563., Cl. 118-692.000.

Liang, Po-lung; and Fisher, Alan R., to Ford Motor Company. Multiple ratio torque converter transmission with main transmission planetary gearing and a compound torque splitter planetary gear unit between the converter and the multiple ratio gearing. 4,408,501., Cl. 74-688.000.

Libby, Charles J., to Automatix Incorporated. Method and apparatus for image acquisition utilizing a concave, cylindrical reflector. 4,409,478., Cl. 250-236.000.

Libert, James T.: *See*—
Profio, Mark V.; Libert, James T.; and Kampf, Julian C., 4,409,640., Cl. 361-197.000.

Libit, Sidney M. Dispenser coffee cap. 4,408,703., Cl. 222-284.000.

Lichter, Robert J. Safe, and method and apparatus for building it. 4,408,545., Cl. 109-50.000.

Lichtner, Frederick W.; and Rose, Jean T., to Betz Laboratories, Inc. Gas scrubbing methods. 4,409,192., Cl. 423-242.000.
Lieb, Julian. Treatment of auto-immune and inflammatory diseases. 4,409,243., Cl. 424-330.000.
Liebschner, Fritz: *See*—
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Jehring, Arnfried; and Liebschner, Fritz, 4,408,529., Cl. 101-415.100.
Lien, Jih-chang: *See*—
Mohan Rao, G. R.; Stanczak, John S.; Lien, Jih-chang; and Bhatia, Shyam, 4,408,385., Cl. 29-576.00B.
Lill, Helmut; and Bartl, Knut, to Boehringer Mannheim GmbH. Stabilized thrombin preparation. 4,409,334., Cl. 436-8.000.
Lill, Helmut: *See*—
Bartl, Knut; Lill, Helmut; Roeschlau, Peter; and Ziegenhorn, Joachim, 4,409,327., Cl. 435-13.000.
Lillie, Christian: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,409,235., Cl. 424-273.00R.
Lim, Franklin, to Damon Corporation. Preparation of substances with encapsulated cells. 4,409,331., Cl. 435-178.000.
Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Production of ethanol from methanol and synthesis gas. 4,409,405., Cl. 568-902.000.
Lindgren, Stig: *See*—
Camitz, Carl-Henning; and Lindgren, Stig, 4,408,747., Cl. 254-382.000.
Lindmo, Tore; and Steen, Harald B., to Ernst Leitz Wetzlar GmbH. Device for hydrodynamic focussing of a particle-suspension in a liquid flow cytophotometer. 4,408,877., Cl. 356-38.000.
Lindsey, William B., to Du Pont de Nemours, E. I., and Company. Viscose preparation using low concentration caustic. 4,409,384., Cl. 536-60.000.
Ling, Nicholas C.; Guillemin, Roger C. L.; Ying, Shao-Yao; and Esch, Frederick S., to Salk Institute for Biological Studies, The. Gonadostatin. 4,409,139., Cl. 260-112.00R.
Lingenbach, Josef: *See*—
Bechthold, Paul; Joswig, Franz; and Lingenbach, Josef, 4,408,478., Cl. 73-24.000.
Link, Paul E.: *See*—
Anderson, Mark A.; Balliett, Robert W.; Link, Paul E.; and Satchell, Donald P., 4,408,985., Cl. 432-1.000.
Liquid Dynamics, Inc.: *See*—
Packer, Martin R., 4,408,635., Cl. 138-30.000.
Lissy, Gunter J., to Nordson Corporation. Powder spray booth. 4,409,09., Cl. 55-302.000.
Litterini, Donald E., to Technical Rubber Company, Inc. Tire repair unit. 4,408,649., Cl. 152-367.000.
Littrell, J. Kerry, to Peabody Spunstrand, Inc. Sound attenuator. 4,408,679., Cl. 181-243.000.
Liu, James: *See*—
Sandrock, Gary D.; Huston, Ernest L.; and Liu, James, 4,409,180., Cl. 420-455.000.
Livigni, Russell A.: *See*—
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,409,368., Cl. 525-314.000.
Lo, Kwok S., to Wavetek. Pulse delay compensation for frequency synthesizer. 4,409,564., Cl. 331-16.000.
Loctite Corporation: *See*—
Holmes, Mark; and Frauenglass, Elliott, 4,409,111., Cl. 252-30.000.
Loda, Gary K.; and Farrell, Sherman R., to RPC Industries. Phase transition cooled window for broad beam electron gun. 4,409,511., Cl. 313-34.000.
Lodge & Shipley Company, The: *See*—
Glover, Charles G., 4,408,436., Cl. 53-247.000.
Lodico, Richard. Windshield wiper cleaning product. 4,409,116., Cl. 252-91.000.
Lofgren, Folke; and Soderstrom, Sven-Erik, to ASEA Aktiebolag. Fiber optic temperature-measuring apparatus. 4,409,476., Cl. 250-227.000.
Loftin, Royal E.: *See*—
Carney, Leroy L.; Loftin, Royal E.; Anderson, Thomas E.; and Vasquez, Guillermo, 4,409,108., Cl. 252-8.50C.
Logic Devices, Inc.: *See*—
Allen, Paul E., 4,408,960., Cl. 417-54.000.
Lohrberg, Karl: *See*—
Haas, Gunther; Plass, Ludolf; and Lohrberg, Karl, 4,409,086., Cl. 204-269.000.
Long, William B.: *See*—
Eaby, Daniel G.; Long, William B.; and Shuey, John R., 4,408,820., Cl. 339-156.00R.
Long, William D.; and Rottenkolber, Paul J., to Kennecott Corporation; and Volkswagenwerk Aktiengesellschaft. Ceramic radial turbine wheel. 4,408,959., Cl. 416-241.00B.
Longwell, John P.; and Peters, William A., to Massachusetts Institute of Technology. Process for detoxifying coal tars. 4,409,094., Cl. 208-121.000.
Longyear Australia Pty. Ltd.: *See*—
Paech, Ivor N., 4,408,766., Cl. 277-3.000.
Looney, Judy A. Supportive shoe and insert. 4,408,402., Cl. 36-43.000.
Looney, Ralph W.: *See*—
Langer, Arthur W., Jr.; Doyle, Gerald; Burkhardt, Terry J.; and Looney, Ralph W., 4,409,409., Cl. 585-255.000.
Lord Corporation: *See*—
Zalucha, Denis J.; Sexsmith, Frederick H.; and Howard, Dennis D., 4,409,383., Cl. 528-499.000.
L'Oreal: *See*—
Gaetani, Quintino; Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, 4,409,379., Cl. 526-230.500.
Lorenz, Hellmut: *See*—
Bauer, Karl; Dammann, Peter; Kubler, Hermann; and Lorenz, Hellmut, 4,408,448., Cl. 57-336.000.
Louie, Edmund A., to GTE Products Corporation. Cable tension meter. 4,408,925., Cl. 403-27.000.
Lovey, Raymond G.: *See*—
Bristol, James A.; and Lovey, Raymond G., 4,409,226., Cl. 424-256.000.
Lowis, Royce; and Tunbridge, Peter M., to U.S. Philips Corporation. Method of manufacturing an insulated-gate field-effect transistor. 4,408,384., Cl. 29-571.000.
Lubrizol Corporation, The: *See*—
LeSuer, William M., 4,409,000., Cl. 44-70.000.
Lucas Industries Limited: *See*—
Edwards, Roy E.; and Price, Anthony G., 4,408,805., Cl. 303-6.00A.
Ludwig, George C.: *See*—
Dodson, Daniel P.; and Ludwig, George C., 4,408,751., Cl. 267-120.000.
Luepertz, Hans-Henning, to ITT Industries, Inc. Mechanically controllable brake booster. 4,408,457., Cl. 60-547.100.
Luft, Harald, to Kernforschungsanlange Julich GmbH. Method of determining sulfur dioxide in gases and apparatus therefor. 4,409,069., Cl. 204-1.00T.
Luwa A.G.: *See*—
Rice, William T., III, 4,408,893., Cl. 366-339.000.
Lynch, Thomas E.: *See*—
Dibble, Eric P.; and Lynch, Thomas E., 4,409,071., Cl. 204-15.000.
Lyon Metal Products, Incorporated: *See*—
Steinke, Mark H., 4,408,928., Cl. 403-405.000.
Lyons, Charles E.; and Tung, Lu H., to Dow Chemical Company, The. Transparent impact resin and process for the preparation thereof. 4,409,369., Cl. 525-314.000.
M.A.N.—Roland Druckmaschinen Aktiengesellschaft: *See*—
Mathes, Josef, 4,408,526., Cl. 101-216.000.
Rebel, Herbert, 4,408,525., Cl. 101-183.000.
Macdermid Incorporated: *See*—
Landau, Adela, 4,409,037., Cl. 148-6.14R.
Machat, Jean-Yves: *See*—
Gerard, Francois; and Machat, Jean-Yves, 4,409,304., Cl. 429-158.000.
Machonis, John, Jr.: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,409,364., Cl. 525-74.000.
MacInnis, Martin B.: *See*—
Vanderpool, Clarence D.; and MacInnis, Martin B., 4,409,019., Cl. 75-0.5AA.
Mack, Karl E.: *See*—
Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, 4,409,400., Cl. 568-346.000.
Mackay, Donald A. M.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Hopkins, Walter; Parker, Ellery; and Mackay, Donald A. M., 4,409,244., Cl. 426-5.000.
Witzel, Frank; DiNolfo, Mario A.; Rodney, Burton; and Mackay, Donald A. M., 4,409,202., Cl. 424-49.000.
Macklem, F. Sutherland. Colorimeter test kit apparatus. 4,409,182., Cl. 422-61.000.
Mactron, Inc.: *See*—
DeCamp, James E.; Arndt, Raymond J.; and Gruzewski, Ronald L., 4,408,562., Cl. 118-669.000.
Madan, Arun: *See*—
Ovshinsky, Stanford R.; and Madan, Arun, 4,409,605., Cl. 357-2.000.
Maeshima, Katsuyoshi: *See*—
Tomosada, Masahiro; and Maeshima, Katsuyoshi, 4,408,869., Cl. 355-14.00R.
Maessen, Johannes G. H.: *See*—
Kleuskens, Engelina C.; Maessen, Johannes G. H.; and van de Mond, Theodorus J., 4,409,122., Cl. 502-20.000.
Magnum Division of Tandon Corporation: *See*—
Puls, Norman M., 4,409,629., Cl. 360-99.000.
Maguire, James V. Expansion sleeve. 4,408,938., Cl. 411-71.000.
Magyar, Karoly: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,409,219., Cl. 424-250.000.
Mahagan, Deroy E.: *See*—
Keller, Phillip D.; Urich, Oren D.; and Mahagan, Deroy E., 4,408,551., Cl. 111-85.000.
Mahieu, Claude: *See*—
Gaetani, Quintino; Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, 4,409,379., Cl. 526-230.500.
Maier-Laxhuber, Peter: *See*—
Alefeld, Georg; and Maier-Laxhuber, Peter, 4,408,468., Cl. 82-476.000.
Maine: *See*—
Fetchin, John A., 4,409,131., Cl. 502-263.000.
Maine, James W.: *See*—
Lehle, Fredric R.; Maine, James W.; Grossman, David; Leavitt, Richard A.; and Putnam, Alan R., 4,408,414., Cl. 47-1.00R.
Maja Maschinenfabrik Hermann Schill GmbH: *See*—
Schill, Herman, 4,408,519., Cl. 99-486.000.

Majima, Teiji, to Fujitsu Limited. Method of projecting circuit patterns. 4,408,875., Cl. 355-53.000.

Malaviya, Shashi D., to International Business Machines Corporation. Single isolation cell for DC stable memory. 4,409,673., Cl. 365-180.000.

Malom-Es Sutoipari Kutatointezet: *See*—
Solymes, Laszlo, 4,409,008., Cl. 55-261.000.

Maltsev, Vladimir I.: *See*—
Salikhov, Zufar G.; Ivanov, Vasily A.; Vyatchinov, Viktor P.; Maltsev, Vladimir I.; Grozdev, Sergei S.; and Khodov, Nikolai V., 4,409,101., Cl. 210-266.000.

Maltz, Javier E., to Etablissement Texcontor. Non-absorbable compounds of mucolytic activity, the process for their preparation, and therapeutic compositions which contain them as active principle. 4,409,138., Cl. 260-112.00R.

Mannesmann Aktiengesellschaft: *See*—
Frommann, Klaus, 4,409,265., Cl. 427-271.000.
Kummerling, Rolf; Poos, Robert; Pentzien, Thomas; and Papierok, Karl-Heinz, 4,408,477., Cl. 72-478.000.

Mannington Mills: *See*—
Wiley, John W.; Brower, Charles H.; and Wang, David, 4,409,280., Cl. 428-203.000.

Mansion Industries, Inc.: *See*—
Zieg, Steven A., 4,408,749., Cl. 256-67.000.

Mantis Excavators, Ltd.: *See*—
Witty, Brian H., 4,408,949., Cl. 414-694.000.

Marcamor, Inc.: *See*—
Brodbeck, Robert M., 4,409,440., Cl. 179-90.0BD.

Markarian, Paul M., to Sprague Electric Company. Capacitor cover-terminal assembly. 4,408,818., Cl. 339-147.00C.

Marley, Christopher: *See*—
Darwood, Phillip I.; Holland, Ernest; Taylor, Peter M.; and Marley, Christopher, 4,408,399., Cl. 33-203.180.

Marsch, James E.; and Eckert, Herbert L., to Harnischfeger Corporation. Hydraulically actuated winch assembly. 4,408,746., Cl. 254-344.000.

Marshall, Claude J., Jr., to Rockwell International Corporation. Composite wheel cover. 4,408,804., Cl. 301-37.00R.

Marshall, Samuel W. Generalized drifting oceanographic sensor. 4,408,488., Cl. 73-170.00A.

Martel, Catala & Cie: *See*—
Karm, Robert, 4,408,637., Cl. 139-425.00A.

Martensson, Anders K.: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,408,682., Cl. 188-202.000.

Marti, Jordi: *See*—
Datta, Amitava; Davis, Lance A.; DeCristofaro, Nicholas J.; and Marti, Jordi, 4,409,041., Cl. 148-31.550.

Martin, Hans. Sports shoe or boot. 4,408,403., Cl. 36-115.000.

Martin, Lawrence L.; Worm, Manfred; and Crichlow, Charles A., to Hoechst-Roussel Pharmaceuticals, Inc. Process for preparing 4-phenyl-1,3-benzodiazepines. 4,409,145., Cl. 260-239.0BD.

Martin, Michael K., to Shell Oil Company. Process for forming oil-soluble product. 4,409,120., Cl. 525-280.000.

Martin, Roger: *See*—
Whitehead, Norman P.; Boness, Kenneth D.; and Martin, Roger, 4,409,617., Cl. 358-147.000.

Martinelli, Lawrence R.; and Lat, Geronimo E., to United States Gypsum Company. Metal article having three-dimensional wood grain and stainable coating. 4,409,276., Cl. 428-142.000.

Maruyama, Teruo, to Matsushita Electric Industrial Co., Ltd. Pump for supplying liquid fuel. 4,408,966., Cl. 417-356.000.

Maryland Cup Corporation: *See*—
Busse, Charles E., 4,409,045., Cl. 156-69.000.

Masao, Sasaki, to Oki Electric Industry Co., Ltd. Ink ribbon protecting mechanism in ink ribbon cartridge. 4,408,910., Cl. 400-207.000.

Masazumi, Yoshida: *See*—
Kawamura, Takao; and Masazumi, Yoshida, 4,409,311., Cl. 430-95.000.

Masco Corporation of Indiana: *See*—
Baker, William, 4,409,688., Cl. 455-165.000.

Maseki, Shinobu: *See*—
Sakakibara, Shiro; Maseki, Shinobu; Watanabe, Kazuaki; and Minemoto, Isamu, 4,408,462., Cl. 60-330.000.

Mashinin, Vladimir V.: *See*—
Leonov, Ivan A.; Smirnov, Boris V.; Mashinin, Vladimir V.; and Sharovatov, Viktor I., 4,408,726., Cl. 242-7.090.

Mason, Robert J.: *See*—
Patton, Willard T.; and Mason, Robert J., 4,409,566., Cl. 333-26.000.

Massachusetts Institute of Technology: *See*—
Gossard, David C.; West, John; Stelson, Kim A.; Allison, Blair; Webb, R. Davis, Jr.; and Hardt, David, 4,408,471., Cl. 72-21.000.
Longwell, John P.; and Peters, William A., 4,409,094., Cl. 208-121.000.

Masters, Jeffrey; Saimbi, Manjit S.; and Webb, Roger J., to British Gas Corporation. Recuperative burners. 4,408,983., Cl. 431-116.000.

Masuda, Kouichi: *See*—
Kusano, Takuo; Masuda, Kouichi; and Namba, Masatoshi, 4,408,379., Cl. 29-159.100.

Masugi, Takashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,214., Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,215., Cl. 424-246.000.

Matburn (Holdings) Limited: *See*—
Lee, Norman J., 4,408,633., Cl. 137-596.200.

Mathes, Josef, to M.A.N.—Roland Druckmaschinen Aktiengesellschaft. No-play gear drive for printing machines. 4,408,526., Cl. 101-216.000.

Mathewson, Myron: *See*—
Murnane, Raymond J.; Gomore, Stephen C.; and Mathewson, Myron, 4,408,467., Cl. 62-296.000.

Matsubara, Noboru: *See*—
Kosuda, Toru; Takeuchi, Yasuhiro; Matsubara, Noboru; and Takizawa, Masaaki, 4,408,580., Cl. 123-90.160.

Matsuda, Kazuo; Kohno, Mitsuo; and Doi, Yoshinao, to Asahi Kasei Kogyo. Hydrophilic sulfonated polyolefin porous membrane and process for preparing the same. 4,409,339., Cl. 521-143.000.

Matsuda, Shimpei: *See*—
Takeuchi, Seizi; and Matsuda, Shimpei, 4,409,129., Cl. 502-185.000.

Matsui, Hiroshi; Sakami, Kazuo; Nishioka, Matsuo; and Onizawa, Takashi, to Matsushita Electric Industrial Co., Ltd. Pull-push switch. 4,409,448., Cl. 200-153.0LA.

Matsui, Hirotoshi: *See*—
Iwai, Hiroji; and Matsui, Hirotoshi, 4,408,917., Cl. 400-637.200.

Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Optical apparatus and method for reproducing information recorded in a magnetic recording medium. 4,409,631., Cl. 360-114.000.

Matsunaga, Isao: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Matsuo, Munetsugu: *See*—
Yokoyama, Hideo; Shimbashi, Ichiro; Sakurai, Koichi; and Matsuo, Munetsugu, 4,408,561., Cl. 118-72.000.

Matsushige, Takashi: *See*—
Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, 4,409,682., Cl. 369-3.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kanai, Kenji; Kaminaka, Nobuyuki; Nouchi, Norimoto; and Nomura, Noboru, 4,409,632., Cl. 360-123.000.
Maruyama, Teruo, 4,408,966., Cl. 417-356.000.
Matsui, Hiroshi; Sakami, Kazuo; Nishioka, Matsuo; and Onizawa, Takashi, 4,409,448., Cl. 200-153.0LA.
Setsune, Kentaro; and Tanaka, Toshihide, 4,409,567., Cl. 333-151.000.

Matsuura, Katsumi: *See*—
Sato, Ryosuke; Hotta, Yuji; and Matsuura, Katsumi, 4,409,323., Cl. 430-544.000.

Matt. Hohner AG: *See*—
Deforeit, Christian J., 4,408,511., Cl. 84-1.010.

Matthews, Donald P., to Dow Chemical Co., The. 4-(((Heterocyclo)-thio)methyl)benzoic acids, esters and amides and their pharmaceutical use. 4,409,227., Cl. 424-263.000.

Mattia, Manlio M. Removal and concentration of organic vapors from gas streams. 4,409,006., Cl. 55-28.000.

Mattis, Donald J., to Sun Chemical Corporation. P. C. Board bobbin construction. 4,408,817., Cl. 339-147.00R.

Maurer, Donald D., to EMPI, Inc. Capacitive energy source and circuitry for powering medical apparatus. 4,408,607., Cl. 128-419.00R.

Mausner, Eberhard, to Robert Bosch GmbH. Apparatus for supplementary fuel metering in an internal combustion engine. 4,408,588., Cl. 123-489.000.

Mauz, Gerhard: *See*—
Gerstle, Volker; Mauz, Gerhard; and Zondler, Rolf, 4,409,306., Cl. 430-28.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Scheid, Peter; and Slama, Heinrich, 4,409,482., Cl. 250-282.000.

Maximov, Jury V.: *See*—
Azarevich, Gennady M.; Maximov, Jury V.; Akimov, Boris I.; and Gusyatsky, Iosif A., 4,408,472., Cl. 72-71.000.

Mayer, Cornelius; Durrer, Jorg; and Weber, Ronald, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method for indirectly laying a weapon and apparatus for the performance of the method. 4,409,468., Cl. 235-404.000.

Mayer, Rothkopf Industries, Inc.: *See*—
Quay, Earl R., 4,408,370., Cl. 19-105.000.
Quay, Earl R., 4,408,371., Cl. 19-114.000.

Mayley, David E.: *See*—
Ketteringham, Terence A.; Lewis, Dennis L.; and Mayley, David E., 4,408,378., Cl. 28-289.000.

Mazelsky, Bernard, to ARA, Inc. Variable energy absorbing system for crashworthy helicopter seats. 4,408,738., Cl. 244-122.00R.

Mazzafro, William J.: *See*—
Vora, Suresh M.; Mazzafro, William J.; Brian, Pierre L. T.; and Chen, Michael S. K., 4,409,064., Cl. 159-47.100.

McAfee, Catherine A.: *See*—
Santee, Harold P., 4,408,664., Cl. 166-263.000.

McAllister, Lawrence E.; and Dietrich, Herbert, to Fiber Materials, Inc. Fire retardant polymer resin. 4,409,361., Cl. 524-876.000.

McAllister (Sports Games) Limited: *See*—
McAllister, William, 4,408,761., Cl. 273-85.00R.

McAllister, William, to McAllister (Sports Games) Limited. Game and game devices. 4,408,761., Cl. 273-85.00R.

McCabria, Jack L., to Westinghouse Electric Corp. Self-cooled electrical machine with integrated fan and salient pole rotor. 4,409,502., Cl. 310-61.000.

McCormick & Company, Inc.: *See*—
Deline, G. Duane, 4,409,257., Cl. 426-651.000.
McCoy, James N. Gas gun assembly. 4,408,676., Cl. 181-113.000.
McElroy, Lucian G.; and Day, David R. Clamp for varying the hinging action of a fluid stripping bag. 4,409,035., Cl. 134-6.000.
McEvers, Dale L.: *See*—
Coy, Donald L.; and McEvers, Dale L., 4,408,506., Cl. 82-20.000.
McGibbon, Graeme, to Wiggins Teape Group Limited, The. Process for the manufacture of color developing material and product. 4,409,272., Cl. 428-98.000.
McGill, Howard L., to Schlumberger Technology Corporation. Rotary straddle tester apparatus with safety joint back-off clutch. 4,408,485., Cl. 73-155.000.
McIntire, Ronald A.: *See*—
Tyree, Charles N.; Fike, Lester L., Jr.; and McIntire, Ronald A., 4,409,443., Cl. 200-83.00N.
McKendrick, Lorne J. Method and apparatus for separating liquid and solid contaminants from a flowing gas. 4,409,005., Cl. 55-1.000.
McMann, Renville H., Jr.; Kreinik, Stephen; and Novack, Martin M., to Thomson-CSF Broadcast, Inc. Video imaging with automatically controlled radiation source. 4,409,615., Cl. 358-111.000.
McTamaney, Louis S.; and Haley, Frank P., to FMC Corporation. Ship-to-ship fluid transfer system. 4,408,943., Cl. 414-138.000.
Mechanical Technolgy Incorporated: *See*—
Rauch, Jeffrey S., 4,408,456., Cl. 60-518.000.
Meeks, Leighton A.: *See*—
Frimet, Stanley H.; and Meeks, Leighton A., 4,409,628., Cl. 360-73.000.
Mehdi, Mehdi G.: *See*—
Northcote, Reginald D.; and Mehdi, Mehdi G., 4,408,566., Cl. 122-4.00D.
Meier, Heinrich: *See*—
Kleinknecht, Hans P.; Ham, William E.; and Meier, Heinrich, 4,408,884., Cl. 356-355.000.
Meier, Jacques, to Ferag AG. Method and apparatus for gathering together sheets or the like into multi-sheet printed products, especially newspapers and magazines. 4,408,754., Cl. 270-52.000.
Meier, Jacques, to Ferag AG. Method and apparatus for forming multi-sheet printed products, especially newspapers and magazines. 4,408,755., Cl. 270-52.000.
Meinguss, Alain: *See*—
Basset, Jean-Claude; and Meinguss, Alain, 4,409,434., Cl. 178-22.190.
Meise, Gunther: *See*—
Unger, Herbert; and Meise, Gunther, 4,408,967., Cl. 417-571.000.
Meller, Theo; and Knecht, Heinz, to BOGE GmbH. Self pumping, level regulating apparatus for vehicles, especially automobiles. 4,408,773., Cl. 280-611.000.
Mena-Reyes, Manuel A.: *See*—
Walther, Mike C.; and Mena-Reyes, Manuel A., 4,408,920., Cl. 401-176.000.
Menault, Jacques; and Rodier, Henry, to Rhone-Poulenc-Textile. Cellulose-acrylonitrile polymer solutions, articles, and methods of making same. 4,409,289., Cl. 428-374.000.
Mengler, Claus-Dieter: *See*—
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,409,394., Cl. 549-534.000.
Mennel, Gabriel B., to Sacilor Acieries et Laminoirs de Lorraine. Rolling mill rolls. 4,408,475., Cl. 72-221.000.
Mennicken, Gerhard: *See*—
Wieczorrek, Wolfhart; and Mennicken, Gerhard, 4,409,266., Cl. 427-302.000.
Merck & Co., Inc.: *See*—
Thorsett, Eugene D.; and Harris, Elbert E., 4,409,146., Cl. 260-239.30R.
Mergan, Leo M.; and Cordier, Jean-Pierre, to Belgonucleaire. Solidification of radioactive waste effluents. 4,409,137., Cl. 252-632.000.
Merger, Franz: *See*—
Krabetz, Richard; Merger, Franz; and Schwarzmann, Matthias, 4,409,128., Cl. 502-211.000.
Meridian Industries, Inc.: *See*—
Crouch, Bill W.; Sauer, William F.; and Zylka, Kenneth R., 4,408,437., Cl. 53-431.000.
Merriam, Marshall & Bicknell: *See*—
Condon, Edward L., 4,408,782., Cl. 283-70.000.
Merrick, James W., to General Dynamics Corporation. Electronic engine control. 4,408,582., Cl. 123-415.000.
Merrick, James W., to Automatic Controls, Corp. Ignition timing control. 4,408,583., Cl. 123-415.000.
Merten, Rudolf: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Tima, Milan J.; and Michael, Dietrich, 4,409,347., Cl. 524-91.000.
Messer Griesheim GmbH: *See*—
Buschkens, Guido; and Nobis, Peter, 4,409,252., Cl. 426-396.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Beusse, Hans, 4,409,658., Cl. 364-424.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Schwaerzler, Hans, 4,408,737., Cl. 244-110.00D.
Metallgesellschaft Aktiengesellschaft: *See*—
Haas, Gunther; Plass, Ludolf; and Lohrberg, Karl, 4,409,086., Cl. 204-269.000.
Metallurgical, Inc.: *See*—
Upperman, Gary V.; and Withers, James C., 4,409,083., Cl. 204-245.000.
Metallwerk Max Brose GmbH & Co.: *See*—
Adomeit, Heinz-Dieter; and Schulz, Volkmar, 4,408,802., Cl. 297-452.000.
Metz, Pierre, to Thomson-CSF. Process for piloting and guiding projectiles in the terminal phase and a projectile comprising means for implementing this process. 4,408,735., Cl. 244-3.220.
Meyer, Charles R. Pulverizer device for handling liquids containing solid and semi-solid materials. 4,408,724., Cl. 241-46.170.
Meyer, Richard C.: *See*—
Neeper, Robert K.; and Meyer, Richard C., 4,409,530., Cl. 318-685.000.
Meyerhoefer, Carl E.: *See*—
Meyerhoefer, Carl H.; and Meyerhoefer, Carl E., 4,408,622., Cl. 132-73.000.
Meyerhoefer, Carl H.; and Meyerhoefer, Carl E., to Revlon, Inc. Fingernail extension. 4,408,622., Cl. 132-73.000.
Michael, Dietrich: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Tima, Milan J.; and Michael, Dietrich, 4,409,347., Cl. 524-91.000.
Michalak, Stanislaw: *See*—
Hermanns, Bernd; and Michalak, Stanislaw, 4,408,659., Cl. 165-10.000.
Michaud, Alfred G.: *See*—
Bonnycastle, Joseph R.; Michaud, Alfred G.; and Rowley, Edward K., 4,409,155., Cl. 264-3.00R.
Michel, Rudolph H.: *See*—
Kolouch, Robert J.; and Michel, Rudolph H., 4,409,167., Cl. 264-102.000.
Michel, Wolfgang, to Hoechst Aktiengesellschaft. Visual information carrier comprising a flexible plastic sheet. 4,409,277., Cl. 428-156.000.
Michigan Technological University, Board of Control of: *See*—
Haataja, Bruce A., 4,408,544., Cl. 108-53.300.
Micro-Circuits Co., Inc.: *See*—
Bradley, Robert F.; and Bradley, Lindell P., 4,408,557., Cl. 116-206.000.
Midland-Ross Corporation: *See*—
Knecht, George W., 4,408,816., Cl. 339-143.00R.
Mihayashi, Keiji: *See*—
Yagihara, Morio; Hirano, Tsumoru; Mihayashi, Keiji; and Ozawa, Takashi, 4,409,320., Cl. 430-381.000.
Mihovch, John; and Blackwood, John, to Singer Company, The. Low torque direct dialing pattern selection mechanism. 4,408,553., Cl. 112-158.00A.
Mikami, Takashi: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,409,282., Cl. 428-219.000.
Milam, Thomas B.: *See*—
Hartman, Paul R.; and Milam, Thomas B., 4,408,832., Cl. 350-310.000.
Milkovich, Ralph, to Atlantic Richfield Company. Footwear-compounds from derivatized star-block copolymers. 4,409,357., Cl. 524-505.000.
Miller, Charles G.; and Stephens, James B. Curtain for shrouding welding operations. 4,408,834., Cl. 350-321.000.
Miller, Elbrige H. Safety latch for in swinging doors. 4,408,789., Cl. 292-268.000.
Miller, Jan D.: *See*—
Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., 4,409,090., Cl. 208-11.0LE.
Miller, John W. V., to Owens-Illinois, Inc. Method and apparatus for monitoring a glass furnace. 4,409,012., Cl. 65-29.000.
Miller, Richard F., to Atlantic Richfield Company. Inhibiting polymerization of vinyl aromatic monomers. 4,409,408., Cl. 585-4.000.
Milliken Research Corporation: *See*—
Weitzel, Edward W., 4,409,273., Cl. 428-109.000.
Millmaster Onyx Group, Inc.: *See*—
Swift, Harold E.; Innes, Robert A.; and Onopchenko, Anatoli, 4,409,399., Cl. 564-473.000.
Milsom, Robert F.; Murray, Robert J.; and Flinn, Ian, to U.S. Philips Corporation. Surface acoustic wave filters. 4,409,571., Cl. 333-196.000.
Mimura, Fumio; and Asakawa, Hiroo, to Nichiei Distribution Systems, Inc.; and Nippon Kokan Kabushiki Kaisha. Binding device for elongated pipes. 4,408,741., Cl. 248-68.0CB.
Min, Mart V.; Parve, Toomas E.; Khyarm, Khyarmo E.; and Pungas, Toom A. Quadrature stepwave frequency converter. 4,409,555., Cl. 328-14.000.
Minamikawa, Yoshitugu: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; Fujimoto, Tsuneo; and Kubota, Minoru, 4,409,197., Cl. 423-415.00P.
Minatono, Shobu: *See*—
Takamatsu, Hideo; and Minatono, Shobu, 4,409,056., Cl. 156-334.000.
Minegishi, Keiichi; Akiba, Tokuji; Harada, Hiroshi; Takei, Akihiko; and Abe, Motoshi, to Chichibu Cement Co., Ltd. Material for destroying concrete structures. 4,409,030., Cl. 106-97.000.
Minemoto, Isamu: *See*—
Sakakibara, Shiro; Maseki, Shinobu; Watanabe, Kazuaki; and Minemoto, Isamu, 4,408,462., Cl. 60-330.000.
Minezaki, Shigehiro: *See*—
Kozaki, Syuichi; Funada, Fumiaki; and Minezaki, Shigehiro, 4,408,837., Cl. 350-336.000.

Minnesota Mining and Manufacturing Company: *See*—
Incremona, Joseph H., 4,408,532., Cl. 101-456.000.
Molenda, Robert P.; and Rabuse, George R., 4,409,057., Cl. 156-92.000.
Zeller-Pendrey, Jeanine I.; Skinner, Mark C.; and Morgan, David A., 4,409,316., Cl. 430-263.000.

Minolta Camera Kabushiki Kaisha: *See*—
Imura, Toshinori; and Tominaga, Shinji, 4,408,855., Cl. 354-25.000.
Kawamura, Takao; and Masazumi, Yoshida, 4,409,311., Cl. 430-95.000.
Kojima, Hiroaki, 4,408,871., Cl. 355-14.00R.
Toriumi, Shiro; Ishii, Kenjiro; and Yamagishi, Seiichi, 4,408,732., Cl. 242-192.000.

Minowa, Masahiro, to Epson Corporation. Thermal printer drive circuit. 4,409,600., Cl. 346-76.0PH.

Misaka, Yoshiharu; and Morita, Takamitsu, to Mitsubishi Chemical Industries Limited. Suspension polymerization process. 4,409,377., Cl. 526-93.000.

Misch, Carl E. Endodontic dental implant. 4,408,990., Cl. 433-224.000.

Misencik, John J.; and Clements, Alden K., to Westinghouse Electric Corp. Ground fault circuit interrupter with a unified test and reset switch mechanism. 4,409,574., Cl. 335-18.000.

Mishima, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho; and Tokyo Shibaura Denki Kabushiki Kaisha. Tone source of rhythm. 4,408,512., Cl. 84-1.030.

Miskowicz, John S., to Gateway Industries, Inc. Buckle with integral push button spring and reaction portions. 4,408,373., Cl. 24-230.00A.

Mita Industrial Co. Ltd.: *See*—
Ikeda, Toshimitsu; Honda, Nobuyasu; and Nakano, Tetsuya, 4,409,312., Cl. 430-110.000.

Mitono, Yoshiharu: *See*—
Enomoto, Hiromu; Mitono, Yoshiharu; Yasuda, Yasushi; Imaizumi, Taketo; and Ohta, Hiroshi, 4,409,495., Cl. 307-290.000.

Mitsubishi Chemical Industries Limited: *See*—
Misaka, Yoshiharu; and Morita, Takamitsu, 4,409,377., Cl. 526-93.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kawabata, Takao, 4,409,533., Cl. 318-807.000.
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,444., Cl. 200-144.00R.
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,445., Cl. 200-144.00R.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; Fujimoto, Tsuneo; and Kubota, Minoru, 4,409,197., Cl. 423-415.00P.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kogo, Nobuhiko; Tsutsui, Yoshimitsu; Kato, Koji; and Kishigami, Hisao, 4,409,160., Cl. 264-40.100.
Yano, Tadashi; and Hoshino, Noriyuki, 4,408,530., Cl. 101-415.100.

Mitsui, Akio: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,409,324., Cl. 430-546.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Asanuma, Tadashi; Uchikawa, Nobutaka; and Shiomura, Tetsunosuke, 4,409,378., Cl. 526-125.000.

Miyanaga, Masaaki, to Kabushiki Kaisha Miyanaga. Metal borer. 4,408,935., Cl. 408-206.000.

Miyashiro, Mutsumi: *See*—
Kobayashi, Hisamine; and Miyashiro, Mutsumi, 4,408,417., Cl. 51-163.200.

Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, to Olympus Optical Company Limited. Collator with collate mode and job separation mode. 4,408,756., Cl. 271-288.000.

Miyashita, Kiyoshi: *See*—
Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, 4,408,870., Cl. 355-14.0SH.

Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, to UBE Industries, Ltd. Process for the production of glycollic acid esters. 4,409,395., Cl. 560-179.000.

Miyazaki, Kunio; Okosi, Yukio; Kumagai, Akira; and Suzuki, Hitoshi, to Hitachi, Ltd. Method of metallizing sintered ceramics. 4,409,079., Cl. 204-192.00C.

Mizelle, Ned W., to Lane Company, Inc., The. Mechanism for providing angular adjustability to legrest of recliner only when projected. 4,408,796., Cl. 297-85.000.

Mizuno, Chiaki; Tamai, Yasuo; and Kasuga, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,409,299., Cl. 428-694.000.

Mizuno, Toshio: *See*—
Namba, Mutsusuke; Suzue, Seisuke; Mizuno, Toshio; and Kataoka, Yoshiaki, 4,409,354., Cl. 524-431.000.

Mizushima, Yoichi; Hosonaga, Taketoshi; Murakami, Takashi; and Ujiie, Nikio, to Nissan Motor Co., Ltd.; and Tachikawa Spring Co., Ltd. Vehicle seat structure for two-door type vehicle. 4,408,798., Cl. 297-326.000.

Mizutani, Hiroshi, to Kabushiki Kaisha Chuo Seisakusho. Electrical resistance welder for nails used in an automatic nailing machine. 4,409,461., Cl. 219-111.000.

Mobil Oil Corporation: *See*—
Bustin, Franz; and Bloomer, Charles K., 4,408,970., Cl. 425-72.00R.
Forbus, Nancy P.; and Kaeding, Warren W., 4,409,132., Cl. 502-62.000.
Givens, Wyatt W., 4,409,480., Cl. 250-252.100.
Haag, Werner O.; and Huang, Tracy J., 4,409,412., Cl. 585-454.000.
Norton, Lonnie J., 4,409,551., Cl. 324-349.000.
Rudnick, Leslie R., 4,409,089., Cl. 208-8.0LE.

Mobile Companies, Inc.: *See*—
Williams, Roger F., 4,409,034., Cl. 134-4.000.

Mochizuki, Norihiro; and Kugimiya, Fusayoshi, to Kayaba Kogyo Kabushiki-Kaisha. Vane pump. 4,408,964., Cl. 417-310.000.

Modrovich, Ivan E. Stabilized enzymatic solutions and method for determining total cholesterol in human serum. 4,409,326., Cl. 435-11.000.

Mohan Rao, G. R.; Stanczak, John S.; Lien, Jih-chang; and Bhatia, Shyam, to Texas Instruments Incorporated. Semiconductor integrated circuit with implanted resistor element in polycrystalline silicon layer. 4,408,385., Cl. 29-576.00B.

Moldavanov, Viktor P.: *See*—
Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P., 4,408,770., Cl. 277-140.000.

Molenda, Robert P.; and Rabuse, George R., to Minnesota Mining & Manufacturing Company. Staple supporting and removing strip. 4,409,057., Cl. 156-92.000.

Mollering, Hans: *See*—
Ziegenhorn, Joachim; Bartl, Knut; Roder, Albert; Lang, Gunter; Mollering, Hans; and Nagele, Ulrich, 4,409,328., Cl. 435-25.000.

Molloy, James J.: *See*—
Applegate, Steven L.; and Molloy, James J., 4,408,908., Cl. 400-120.000.

Monarch Logging Company, Inc.: *See*—
Rochon, Robert W.; and Sneed, Joe W., Jr., 4,408,486., Cl. 73-155.000.

Monarch Marking Systems, Inc.: *See*—
Hurley, Thomas M., 4,408,706., Cl. 224-192.000.

Mondadori, Cesare, to Ciba-Geigy Corporation. Method of preventing and treating cerebral insufficiency. 4,409,212., Cl. 424-244.000.

Money, David K.: *See*—
Daly, Christopher N.; and Money, David K., 4,408,608., Cl. 128-421.000.
Hirshorn, Michael S.; Skalsky, Michael; van Berkum, Petrus A.; Holley, Loraine K.; and Money, David K., 4,408,604., Cl. 128-785.000.

Monk, Robert J. System and method for repair of leaking storage tanks containing fluids which contaminate ground water. 4,408,628., Cl. 137-312.000.

Monsanto Company: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,409,365., Cl. 525-78.000.
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,409,127., Cl. 502-205.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,409,133., Cl. 502-354.000.
Wilkie, Arnold E., 4,408,445., Cl. 57-246.000.
Wilkie, Arnold E., 4,408,446., Cl. 57-246.000.

Montavon, Marc; and Reiner, Roland, to Hoffmann-La Roche Inc. Cephalosporin derivatives. 4,409,387., Cl. 544-26.000.

Montgomery, Melville G. Wave action energy generating system. 4,408,455., Cl. 60-505.000.

Moore, Howard F.: *See*—
Johnson, Charles A.; Ward, Clifford; Moore, Howard F.; and Hettinger, Jr.; William P., 4,409,092., Cl. 208-89.000.

Moore, Thomas W., to Reynolds Metals Company. Slag decarbonization with a phase inversion. 4,409,021., Cl. 75-10.00R.

Moore, William H. Process for producing cast iron. 4,409,028., Cl. 75-130.00R.

Morelli, Morello: *See*—
Prevedello, Aldo; Platone, Edoardo; and Morelli, Morello, 4,409,419., Cl. 585-611.000.

Morgan, Adolph A. Stick and peg game device. 4,408,764., Cl. 273-341.000.

Morgan, David A.: *See*—
Zeller-Pendrey, Jeanine I.; Skinner, Mark C.; and Morgan, David A., 4,409,316., Cl. 430-263.000.

Morganson, Neal E.; and Vayda, Adam V., to Gulf Research & Development Company. Olefin oligomerization using boron trifluoride and an alcohol-polyol cocatalyst. 4,409,415., Cl. 585-525.000.

Mori, Fumio; and Omura, Yoshiaki, to Kuraray Co., Ltd. Insecticides and insecticidal compositions. 4,409,238., Cl. 424-304.000.

Mori, Kouichi: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,408,592., Cl. 123-625.000.

Mori, Motoaki: *See*—
Suwabe, Isaku; and Mori, Motoaki, 4,409,058., Cl. 156-361.000.

Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, to Victor Company of Japan, Limited. Digital editing system for audio programs. 4,409,682., Cl. 369-3.000.

Morigaki, Masakazu: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,409,324., Cl. 430-546.000.

Morino, Seiji: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,408,592., Cl. 123-625.000.

Morioka, Yoshihiro: *See*—
Nakamura, Takashi; Morioka, Yoshihiro; Yamaji, Kazunori; Nakamura, Takashi; Morioka, Yoshihiro; and Yamaji, Kazunori, 4,409,613., Cl. 358-51.000.

Nakamura, Takashi; Morioka, Yoshihiro; Yamaji, Kazunori; Nakamura, Takashi; Morioka, Yoshihiro; and Yamaji, Kazunori, 4,409,613., Cl. 358-51.000.

Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, to Hitachi, Ltd. Powder deposition to form pattern on light imaged photosensitive diazonium salt coating having salt of aromatic amine. 4,409,313., Cl. 430-144.000.

Morita, Kaoru: *See*—
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.

Morita, Takamitsu: *See*—
Misaka, Yoshiharu; and Morita, Takamitsu, 4,409,377., Cl. 526-93.000.

Moriya, Mitsutoshi: *See*—
Naganoma, Masanori; Takemoto, Kazuaki; and Moriya, Mitsutoshi, 4,408,712., Cl. 236-13.000.

Morris, Hayden; and Christianson, Charles, to United States of America, Navy. Radiation detector and method of opaquing the mica window. 4,409,485., Cl. 250-374.000.

Morrison, Lowen R., Jr.; Elder, Melisse N.; and Phillips, John H., to Procter & Gamble Company, The. Recovery of noncaffeine solubles in an extract decaffeination process. 4,409,253., Cl. 426-424.000.

Morton, Michael S. Furnace construction. 4,408,567., Cl. 122-14.000.

Moskousky Institut Stali I Splavov: *See*—
Salikhov, Zufar G.; Ivanov, Vasily A.; Vyatchinov, Viktor P.; Maltsev, Vladimir I.; Grozdev, Sergei S.; and Khodov, Nikolai V., 4,409,101., Cl. 210-266.000.

Mosley, Joseph M.: *See*—
Dorler, Jack A.; and Mosley, Joseph M., 4,409,498., Cl. 307-454.000.

Moss, Elvis W.; and Shackelford, John T., to Brunswick Corporation. Star drag system for sping cast reels. 4,408,729., Cl. 242-84.50A.

Mostosi, Angelo, to SACE S.p.A. Costruzioni Elettromeccaniche. Electric switch. 4,409,572., Cl. 335-8.000.

Motegi, Shoji: *See*—
Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, 4,409,508., Cl. 310-239.000.

Moteki, Tsutomu; Aoki, Kazuo; Yamaguchi, Kunihiro; and Yoshizaki, Michio, to Chisso Corporation. Polyolefin resin composition. 4,409,345., Cl. 524-13.000.

Motion Technology Corporation: *See*—
Steidle, Kurt A., 4,408,876., Cl. 355-54.000.

Motorali, Inc.: *See*—
Shacter, Stuart B., 4,409,561., Cl. 330-300.000.

Motorola, Inc.: *See*—
Bruce, William C., Jr., 4,409,653., Cl. 364-200.000.
Daniels, R. Gary; Bennett, Thomas H.; Musa, Fuad H.; and Wiles, Michael F., 4,409,671., Cl. 364-900.000.
Darnell, Robert D.; and Ingle, William M., 4,409,195., Cl. 423-342.000.
Davis, William F., 4,409,560., Cl. 330-296.000.
Eickerman, Curtis L.; and Ramsey, Arlie A., 4,409,501., Cl. 307-594.000.
Nordbrock, Raymond E.; and Sievers, Kirk A., 4,409,539., Cl. 322-28.000.
Smith, Gregory J., 4,409,494., Cl. 307-238.300.

Motz, Heinz D., to Friedrich Schroeder, Firma. Eyebolt. 4,408,941., Cl. 411-378.000.

Moulson, Thomas J.; and Greenzweig, John E., to Cargill Incorporated. Low shrink unsaturated polyester resinous composition. 4,409,344., Cl. 523-512.000.

Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, to Pierre Fabre S.A. Method of treating anxiety with 2'-(orthochlorobenzoyl)-4'-chloroglycylanilides, and compositions thereof. 4,409,241., Cl. 424-324.000.

Mowrey, Rowland G.: *See*—
Armour, Eugene A.; Henzel, Richard P.; and Mowrey, Rowland G., 4,409,315., Cl. 430-214.000.

MPD Technology Corporation: *See*—
Sandrock, Gary D.; Huston, Ernest L.; and Liu, James, 4,409,180., Cl. 420-455.000.

Mrazek, Franklin C.; and Battles, James E. Method of forming components for a high-temperature secondary electrochemical cell. 4,409,168., Cl. 264-104.000.

MSI Electronics Inc.: *See*—
Lederman, Albert, 4,409,547., Cl. 324-158.00P.
Shulman, Carl, 4,409,546., Cl. 324-158.00P.

MTU Motoren- und Turbinen-Union Friedrichshaften GmbH: *See*—
van Rinsum, Cornelis, 4,408,586., Cl. 123-446.000.

Mueller, Bruce, to Owens-Illinois, Inc. Reinforced plastic home canning ring. 4,408,694., Cl. 215-276.000.

Mukaida, Yutaka: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,409,240., Cl. 424-319.000.

Mukoh, Akio: *See*—
Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,408,840., Cl. 350-349.000.

Muller, Werner H.; Mack, Karl E.; and Hey, Hansjorg, to Hoechst Aktiengesellschaft. Process for the preparation of cyclohexane-1,3-dione from δ-ketohexanoic acid ester. 4,409,400., Cl. 568-346.000.

Muller, Wolfgang: *See*—
Johne, Hans; Forster, Karl-Heinz; Jentzsch, Arndt; and Muller, Wolfgang, 4,408,528., Cl. 101-364.000.

Multicore Solders Limited: *See*—
Shend'ge, Vasant J.; and Thompson, Geoffrey S., 4,408,730., Cl. 242-96.000.

Mumford, George V.: *See*—
Fillmore, William E.; Mumford, George V.; and Smalley, Ned J., 4,408,700., Cl. 222-153.000.

Mummert, Thomas A., to Jobst Institute, Inc. Apparatus for pneumatically controlling a dynamic pressure wave device. 4,408,599., Cl. 128-24.00R.

Munson, Beauford E. Roller cone drill bit. 4,408,671., Cl. 175-377.000.

Murakami, Reiji: *See*—
Takano, Toshimasa; Hosoya, Masahiro; and Murakami, Reiji, 4,408,862., Cl. 355-3.0DD.

Murakami, Takashi: *See*—
Mizushima, Yoichi; Hosonaga, Taketoshi; Murakami, Takashi; and Ujiie, Nikio, 4,408,798., Cl. 297-326.000.

Murakami, Takeshi: *See*—
Ezaki, Atsuo; and Murakami, Takeshi, 4,409,322., Cl. 430-523.000.

Murnane, Raymond J.; Gomore, Stephen C.; and Mathewson, Myron, to Carrier Corporation. Noise suppressing feeder tube for a refrigerant circuit. 4,408,467., Cl. 62-296.000.

Murray Corporation: *See*—
Kish, Arthur S., 4,408,381., Cl. 29-237.000.

Murray, Grant. Electrical manicuring device. 4,408,623., Cl. 132-73.600.

Murray, Joseph E., Jr.; and Sylvester, Paul J., to Polaroid Corporation. Ultrasonic transducer for use in a vibratory environment. 4,409,441., Cl. 179-111.00R.

Murray Ohio Manufacturing Co., The: *See*—
Elmy, Raymond L.; and Crabtree, Joe, 4,408,683., Cl. 192-11.000.

Murray, Robert J.: *See*—
Milsom, Robert F.; Murray, Robert J.; and Flinn, Ian, 4,409,571., Cl. 333-196.000.

Murtha, Timothy P., to Phillips Petroleum Company. Selective hydrogenation of organic materials. 4,409,401., Cl. 568-362.000.

Musa, Fuad H.: *See*—
Daniels, R. Gary; Bennett, Thomas H.; Musa, Fuad H.; and Wiles, Michael F., 4,409,671., Cl. 364-900.000.

Musienko, Viktor T.: *See*—
Karinsky, Viktor N.; Musienko, Viktor T.; and Glazunov, Sergei G., 4,408,971., Cl. 425-8.000.

Mutrux, Claude, to Ebauches Electroniques S.A. Electronic timepiece having a digital frequency correction circuit. 4,408,897., Cl. 368-200.000.

Mutsers, Stanislaus M. P.; Hoek, Cornelis; and Wagemans, Gerardus M. C., to Unie Van Kunstmestfabrieken BV. Process for preparing thermally stable ammonium nitrate- containing granules. 4,408,998., Cl. 23-293.00A.

Mutsers, Stanislaus M. P.; Hoek, Cornelis; and Wagemans, Gerardus M. C., to Unie Van Kunstmestfabrieken, B.V. Process for preparing thermally stable ammonium nitrate-containing granules of high bulk density. 4,409,016., Cl. 71-59.000.

Nabisco Brands, Inc.: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Hopkins, Walter; Parker, Ellery; and Mackay, Donald A. M., 4,409,244., Cl. 426-5.000.
Danielson, Robert L.; and Bosco, Peter M., 4,409,255., Cl. 426-576.000.
Witzel, Frank; DiNolfo, Mario A.; Rodney, Burton; and Mackay, Donald A. M., 4,409,202., Cl. 424-49.000.

Nadkarni, Ramachandra A.; and Williams, Rollie B., to Exxon Research and Engineering Co. Coal and oil shale beneficiation process. 4,408,999., Cl. 44-1.0SR.

Nagai, Masahiko, to Ogawa Chemical Industries, Ltd. Detachable head member having slit structure. 4,408,921., Cl. 401-198.000.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Window comparator circuit. 4,409,497., Cl. 307-360.000.

Naganoma, Masanori; Takemoto, Kazuaki; and Moriya, Mitsutoshi, to Nippondenso Co., Ltd. Apparatus for controlling air conditioners for automobiles. 4,408,712., Cl. 236-13.000.

Nagasaka, Moritoshi: *See*—
Yamamoto, Hideyuki; Nishikawa, Waichi; and Nagasaka, Moritoshi, 4,409,465., Cl. 219-137.0PS.

Nagele, Ulrich: *See*—
Ziegenhorn, Joachim; Bartl, Knut; Roder, Albert; Lang, Gunter; Mollering, Hans; and Nagele, Ulrich, 4,409,328., Cl. 435-25.000.

Nagl, Michael: *See*—
Weber, Ralph; Rollinger, Bernt; Hauk, Rolf; Nagl, Michael; and Rinner, Bernhard, 4,409,023., Cl. 75-38.000.

Naimer, Gundolf, to Payer-Lux Elektroprodukte Gesellschaft m.b.H. Electric shaver. 4,408,392., Cl. 30-34.100.

Nakagaki, Harushige: *See*—
Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, 4,409,559., Cl. 330-295.000.

Nakagawa, Nobuaki: *See*—
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.

Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, to Takara Shuzo Co., Ltd. Polysaccharides having anticarcinogenic activity and method for producing same. 4,409,385., Cl. 536-123.000.

Nakajima, Tohru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Laser knife device. 4,408,602., Cl. 128-303.100.

Nakamura, Hisashi, to Diesel Kiki Co., Ltd. Injection timing control device for distributor-type fuel injection pumps. 4,408,591., Cl. 123-502.000.

Nakamura, Katsunori: *See*—
Fukahori, Hidehiko; Iwashita, Tomonori; and Nakamura, Katsunori, 4,408,859., Cl. 354-274.000.

Nakamura, Kazuo: *See*—
Tokutomi, Seijiro; Nakamura, Kazuo; and Jyojiki, Kasao, 4,408,853., Cl. 354-25.000.

Nakamura, Kenji; and Ideno, Shigeru, to Shimadzu Corporation. Line printer for recording analog signals. 4,409,597., Cl. 346-35.000.

Nakamura, Takashi; Morioka, Yoshihiro; Yamaji, Kazunori; Nakamura, Takashi; Morioka, Yoshihiro; and Yamaji, Kazunori. SEPP-Based deflection control circuit. 4,409,613., Cl. 358-51.000.

Nakamura, Takashi: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,409,324., Cl. 430-546.000.
Nakamura, Takashi; Morioka, Yoshihiro; Yamaji, Kazunori; Nakamura, Takashi; Morioka, Yoshihiro; and Yamaji, Kazunori, 4,409,613., Cl. 358-51.000.

Nakamura, Yasuo: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,409,395., Cl. 560-179.000.

Nakamura, Yoshikatsu: *See*—
Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Kawamura, Osamu, 4,409,294., Cl. 428-553.000.

Nakanishi, Kyoji: *See*—
Kato, Yoshiei; Nozaki, Tsutomu; and Nakanishi, Kyoji, 4,409,024., Cl. 75-60.000.

Nakanishi Metal Works Co., Ltd.: *See*—
Wakabayashi, Takao, 4,408,539., Cl. 104-89.000.

Nakano, Masao: *See*—
Takemae, Yoshihiro; and Nakano, Masao, 4,409,677., Cl. 365-206.000.

Nakano, Tetsuya: *See*—
Ikeda, Toshimitsu; Honda, Nobuyasu; and Nakano, Tetsuya, 4,409,312., Cl. 430-110.000.

Nakao, Hisaji: *See*—
Tomita, Tamaki; Nakao, Hisaji; Nishimura, Hideo; Eto, Kunihiko; and Ohmura, Haruo, 4,408,933., Cl. 408-8.000.

Nakayama, Shozo; Suzuki, Shigeru; and Hattori, Mitsuhiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor. 4,408,962., Cl. 417-269.000.

Nakayama, Shuzi, to Tokico, Ltd. Automatic welding apparatus. 4,409,459., Cl. 219-86.240.

Namba, Masatoshi: *See*—
Kusano, Takuo; Masuda, Kouichi; and Namba, Masatoshi, 4,408,379., Cl. 29-159.100.

Namba, Mutsusuke; Suzue, Seisuke; Mizuno, Toshio; and Kataoka, Yoshiaki, to Daikin Kogyo Co., Ltd. Fluorinated resin coating composition containing micaceous iron oxide. 4,409,354., Cl. 524-431.000.

Nasvytis, Pius J.; and Jahrstorfer, George W., to Chandler Evans Inc. High efficiency centrifugal pump. 4,408,953., Cl. 415-62.000.

NATEC Institut: *See*—
Seidel, Hartmut; and Hammerschmidt, Winrich B., 4,408,401., Cl. 36-3.00B.

National Distillers and Chemical Corporation: *See*—
Feldman, Julian, 4,409,406., Cl. 568-916.000.
Heimberg, Manfred, 4,409,355., Cl. 524-458.000.

National Institute for Researches in Inorganic Materials: *See*—
Sato, Tadao; Endo, Tadashi; Fukunaga, Osamu; and Iwata, Minoru, 4,409,193., Cl. 423-290.000.

Naugle, George H.; Gordon, Robert L.; and Pines, Richard J., to International Paper Company. Process for making a container for storing food. 4,409,053., Cl. 156-287.000.

NCR Corporation: *See*—
Schnathorst, Vernon K.; and Bastian, Gary T., 4,409,680., Cl. 365-233.000.

Neal, Larry V. Plug for holes in walls. 4,408,429., Cl. 52-514.000.

Neeper, Robert K.; and Meyer, Richard C., to Beckman Instruments, Inc. Method and apparatus for stepper motor position control. 4,409,530., Cl. 318-685.000.

Neill, Daniel L.: *See*—
Becker, James; and Neill, Daniel L., 4,409,663., Cl. 364-561.000.

Nelson A. Taylor Co., Inc.: *See*—
Vickery, Donald P., 4,408,368., Cl. 15-243.000.

Nemets, Rusaam S.; Kislov, Vladimir G.; Gorbulev, Efim S.; Koval, Ivan A.; Eremenko, Boris S.; Brainman, Felix A.; Kontsov, Jury M.; Adamovich, Anatoly V.; Burov, Lev A.; and Moldavanov, Viktor P. Piston ring assembly with tangential expander. 4,408,770., Cl. 277-140.000.

Neumann, Leopold; and Kline, Richard B., II, to Siemens AG. Apparatus for processing digital signals. 4,409,652., Cl. 364-200.000.

Neumann, Leopold; and Kline, Richard B., II, to Siemens AG. Signal processing device. 4,409,669., Cl. 364-900.000.

Neumeier, Leander A.: *See*—
Holman, James L., Jr.; and Neumeier, Leander A., 4,409,020., Cl. 75-0.50B.

Neuroth, David H., to Harvey Hubbell Incorporated. Oil well cable. 4,409,431., Cl. 174-103.000.

New York Society for the Relief of the Ruptured and Crippled, Maintaining the Hospital for Special Surgery: *See*—
Burstein, Albert H.; and Bartel, Donald L., 4,408,359., Cl. 3-1.912.

Newcomer, Stephen O.: *See*—
Andersen, Steven C.; Penkauskas, Thomas P.; Kassel, James W.; and Newcomer, Stephen O., 4,409,656., Cl. 364-200.000.

Newton, Roger F.: *See*—
Collington, Eric W.; Finch, Harry; Newton, Roger F.; and Wallis, Christopher J., 4,409,213., Cl. 424-244.000.

Nichiei Distribution Systems, Inc.: *See*—
Mimura, Fumio; and Asakawa, Hiroo, 4,408,741., Cl. 248-68.0CB.

Nichiro Kogyo Company, Ltd.: *See*—
Suwabe, Isaku; and Mori, Motoaki, 4,409,058., Cl. 156-361.000.

Nichols-Homeshield, Inc.: *See*—
Verch, John T., 4,408,650., Cl. 160-121.00R.

Nichols, Richard E.: *See*—
Bollinger, John G.; Nichols, Richard E.; and Delaruelle, Dale H., 4,408,483., Cl. 73-115.000.

Nielsen, Henrik B.; and Nygaard, Nils H., to Danfoss A/S. Arrangement for controlling the driving and braking current of a brushless D.C. motor. 4,409,524., Cl. 318-138.000.

Niemann, Heinz, to Esge-Marby GmbH & Co. KG. Cycle carrier. 4,408,705., Cl. 224-39.000.

Nienart, Louis F.; Fehrman, Richard G.; and Wan, Chung-Chu, to Allied Corporation. Method for making serrated metal ribbon. 4,408,653., Cl. 164-463.000.

Nifco Inc.: *See*—
Kimura, Teiji; and Kimura, Shigeru, 4,408,372., Cl. 24-217.00R.

Nihon Tsushin Gijyutsu Kabushiki Kaisha: *See*—
Asano, Kiyomitsu; and Watanabe, Tetsuo, 4,408,909., Cl. 400-144.200.

Nikitas, Nick C., to Delta Electronic Manufacturing Corp. Coaxial connectors. 4,408,822., Cl. 339-177.00R.

Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,409,176., Cl. 264-527.000.

Nilsson, Ingvar: *See*—
Holmberg, Krister; and Nilsson, Ingvar, 4,409,117., Cl. 252-99.000.

Nilsson, Kenth; and Bolmgren, Jan, to Siemens Aktiengesellschaft. Mosaic recorder with reduced mechanical coupling. 4,409,601., Cl. 346-140.00R.

Nilsson, Kenth: *See*—
Bolmgren, Jan; Hoek, Bertil; and Nilsson, Kenth, 4,409,602., Cl. 346-140.00R.

Ninet, Jean-Louis; and Vaillant, Robert, to Societe Anonyme dite Ateliers et Chantiers de Bretagne-ACB. Device for damping impacts between a load and a floating support when the load is removed. 4,408,930., Cl. 405-209.000.

Nippon Carbureter Co., Ltd.: *See*—
Furumoto, Michitake; and Harada, Shinichi, 4,408,593., Cl. 126-85.00R.

Nippon Elanco Kabushiki Kaisha: *See*—
Yamamoto, Taizo; and Ishida, Tetsuhisa, 4,408,641., Cl. 141-82.000.

Nippon Electric Co., Ltd.: *See*—
Inaba, Masao; and Kashigi, Kazuo, 4,409,618., Cl. 358-183.000.
Nishiguchi, Yukihiro, 4,409,666., Cl. 364-710.000.
Watanabe, Hideaki, 4,409,622., Cl. 358-260.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Suzuki, Hideo, 4,408,514., Cl. 84-1.240.

Nippon Kogaku K.K.: *See*—
Terui, Nobuhiko; and Watanabe, Sakuji, 4,408,854., Cl. 354-25.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Mimura, Fumio; and Asakawa, Hiroo, 4,408,741., Cl. 248-68.0CB.
Ouchi, Chiaki; and Sampei, Tetsuya, 4,408,652., Cl. 164-459.000.

Nippon Light Metal Co., Ltd.: *See*—
Kusano, Takuo; Masuda, Kouichi; and Namba, Masatoshi, 4,408,379., Cl. 29-159.100.

Nippon Oil and Fats Co., Ltd.: *See*—
Araki, Ikuo; Kanazawa, Teruo; Ito, Shinji; and Sumikawa, Kenji, 4,408,534., Cl. 102-288.000.

Nippon Piston Ring Co., Ltd.: *See*—
Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Kawamura, Osamu, 4,409,294., Cl. 428-553.000.

Nippon Soken, Inc.: *See*—
Inagaki, Mitsuo; Sasaya, Hideaki; and Ito, Seitoku, 4,408,968., Cl. 418-15.000.
Kosuda, Toru; Takeuchi, Yasuhiro; Matsubara, Noboru; and Takizawa, Masaaki, 4,408,580., Cl. 123-90.160.
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,408,592., Cl. 123-625.000.

Nippon Steel Corporation: *See*—
Yokoyama, Hideo; Shimbashi, Ichiro; Sakurai, Koichi; and Matsuo, Munetsugu, 4,408,561., Cl. 118-72.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Kobayashi, Makoto; Yamamoto, Tetsuji; and Jimbo, Yoshihiro, 4,409,623., Cl. 358-261.000.
Takayashiki, Tetsuya; Usui, Taiji; and Sakurai, Tetsuma, 4,408,386., Cl. 29-576.00E.

Nippondenso Co., Ltd.: *See*—
Naganoma, Masanori; Takemoto, Kazuaki; and Moriya, Mitsutoshi, 4,408,712., Cl. 236-13.000.

Nisato, Dino; and Carminati, Paolo, to Sanofi. Andrexiant aminopiperidines intermediates thereto and drugs containing same. 4,409,228., Cl. 424-267.000.

Nishigaki, Yuji: *See*—
Okano, Kazumi; Nishigaki, Yuji; and Kasai, Masanao, 4,409,310., Cl. 430-95.000.

Nishiguchi, Yukihiro, to Nippon Electric Co., Ltd. Electronic desk-top calculator with indication function of stored data range. 4,409,666., Cl. 364-710.000.

Nishii, Michiharu; and Ohmi, Atsushi, to Aisin Seiki Kabushiki Kaisha. Method of manufacturing a vacuum booster housing. 4,409,460., Cl. 219-93.000.

Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, to Olympus Optical Company Limited. Duplicating system comprising electrophotographic copying apparatus and option devices. 4,408,870., Cl. 355-14.0SH.

Nishikawa, Waichi: *See*—
Yamamoto, Hideyuki; Nishikawa, Waichi; and Nagasaka, Moritoshi, 4,409,465., Cl. 219-137.0PS.

Nishimura, Hideo: *See*—
Tomita, Tamaki; Nakao, Hisaji; Nishimura, Hideo; Eto, Kunihiko; and Ohmura, Haruo, 4,408,933., Cl. 408-8.000.

Nishino, Hiroshi; Suzuki, Masayuki; and Hirota, Hideo, to Takeda Chemical Industries, Ltd. Process for producing activated fibrous carbon. 4,409,125., Cl. 502-180.000.

Nishioka, Akira: *See*—
Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, 4,409,436., Cl. 381-15.000.

Nishioka, Matsuo: *See*—
Matsui, Hiroshi; Sakami, Kazuo; Nishioka, Matsuo; and Onizawa, Takashi, 4,409,448., Cl. 200-153.0LA.

Nissan Motor Company, Limited: *See*—
Akimune, Yoshio; and Ambe, Satoshi, 4,409,135., Cl. 252-514.000.
Arima, Sumitsugu; Tsujimura, Harutoshi; and Fukunaga, Yukio, 4,409,584., Cl. 340-22.000.
Iijima, Tetsuya; and Takahashi, Seiichi, 4,408,713., Cl. 236-49.000.
Kobayashi, Shigeru, 4,408,714., Cl. 237-12.30C.
Mizushima, Yoichi; Hosonaga, Taketoshi; Murakami, Takashi; and Ujiie, Nikio, 4,408,798., Cl. 297-326.000.
Yabuhara, Hideo; and Kudo, Ichiro, 4,408,584., Cl. 123-440.000.

Nobis, Peter: *See*—
Buschkens, Guido; and Nobis, Peter, 4,409,252., Cl. 426-396.000.

Noda, Sakuo: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,409,240., Cl. 424-319.000.

Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, to Toyo Jozo Kabushiki Kaisha. Peptides for assaying human parathyroid hormone. 4,409,141., Cl. 260-112.50R.

Noeske, Heinz O., to General Electric Company. Gas blast circuit breaker combining a magnetically driven rotating arc and a puffer induced gas blast. 4,409,447., Cl. 200-148.00A.

Noguchi, Fumio, to Shin Meiwa Industry Co., Ltd. Automatic position controlling apparatus. 4,409,650., Cl. 364-193.000.

Nolf, Jean-Marie E.; and Verschelde, Marc, to N.V. Raychem S.A. Splice case. 4,409,426., Cl. 174-21.00R.

Noma Canada Ltd.: *See*—
Koehler, Rudolph, 4,408,813., Cl. 339-38.000.

Nomura, Noboru: *See*—
Kanai, Kenji; Kaminaka, Nobuyuki; Nouchi, Norimoto; and Nomura, Noboru, 4,409,632., Cl. 360-123.000.

Nonclercq, Bernard G.: *See*—
Le Noane, Georges E.; and Nonclercq, Bernard G., 4,408,828., Cl. 350-96.230.

Nonogaki, Saburo: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,409,313., Cl. 430-144.000.

Nordbrock, Raymond E.; and Sievers, Kirk A., to Motorola Inc. Self-excitation for an alternator of the low-carbon steel rotor type. 4,409,539., Cl. 322-28.000.

Nordson Corporation: *See*—
Lissy, Gunter J., 4,409,009., Cl. 55-302.000.

Nordvall, Jan: *See*—
Dahle, Orvar; Hoffman, Bertil; Nordvall, Jan; Siby, Sture; and Widehn, Ake, 4,408,496., Cl. 73-728.000.

Norek, George G. Drawing table. 4,408,850., Cl. 353-122.000.

Norstrud, Iven R.: *See*—
Anderson, Donald R.; Norstrud, Iven R.; and Threlkeld, John H., 4,408,720., Cl. 239-149.000.

Northcote, Reginald D.; and Mehdi, Mehdi G., to Thorn Emi Energy Developments Limited. Boilers. 4,408,566., Cl. 122-4.00D.

Northern Engraving Corporation: *See*—
Gilleo, Kenneth B.; and Kreibich, Willard H., 4,409,264., Cl. 427-265.000.

Norton, Lonnie J., to Mobil Oil Corporation. Telluric survey electrode. 4,409,551., Cl. 324-349.000.

Nottingham, Lawrence D.; and Jugan, Michael R., to Westinghouse Electric Corp. Removable sleeve-to-shaft interlock for dynamoelectric machine. 4,408,383., Cl. 29-453.000.

Nouchi, Norimoto: *See*—
Kanai, Kenji; Kaminaka, Nobuyuki; Nouchi, Norimoto; and Nomura, Noboru, 4,409,632., Cl. 360-123.000.

Novack, Martin M.: *See*—
McMann, Renville H., Jr.; Kreinik, Stephen; and Novack, Martin M., 4,409,615., Cl. 358-111.000.

Novak, Danny E., to Phillips Petroleum Company. Control of a furnace. 4,408,569., Cl. 122-448.00R.

Novamet Inc.: *See*—
Weber, John H., 4,409,038., Cl. 148-12.70A.

Novotny, Carl F., to Allis-Chalmers Corporation. Gap adjusting eccentric pin for articulated seals of rotary kilns. 4,408,768., Cl. 277-84.000.

Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; and Kukes, Semyon, 4,409,418., Cl. 585-667.000.

Nozaki, Tsutomu: *See*—
Kato, Yoshiei; Nozaki, Tsutomu; and Nakanishi, Kyoji, 4,409,024., Cl. 75-60.000.

Nuckel, Klaus; and Schleuchardt, Manfred, to Postalia GmbH. Device for locking and aligning printing numeral rolls and a control cylinder. 4,408,524., Cl. 101-110.000.

Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, to Pioneer Electronic Corporation. Stereo pilot signal eliminating circuit for AM stereophonic receiver. 4,409,436., Cl. 381-15.000.

Nuway Manufacturing Company Limited: *See*—
Palmer, Deryk J., 4,408,365., Cl. 15-112.000.

N.V. Bekaert S.A.: *See*—
Baillievier, Freddy, 4,408,444., Cl. 57-237.000.

N.V. Raychem S.A.: *See*—
Nolf, Jean-Marie E.; and Verschelde, Marc, 4,409,426., Cl. 174-21.00R.

Nygaard, Nils H.: *See*—
Nielsen, Henrik B.; and Nygaard, Nils H., 4,409,524., Cl. 318-138.000.

Nysten, Bernhard: *See*—
von Agris, Rudolf; Kaiser, Gunter; and Nysten, Bernhard, 4,409,052., Cl. 156-227.000.

O.M.V. SpA: *See*—
Padovani, Pietro, 4,409,173., Cl. 264-210.200.

Oana, Yoshinori: *See*—
Wada, Shinji; Oana, Yoshinori; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,408,847., Cl. 351-211.000.

Obayashi, Akira: *See*—
Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.

Oblad, Alex G.: *See*—
Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., 4,409,090., Cl. 208-11.0LE.

O'Brian, Rodney W., to Coal Industry (Patents) Ltd. Control systems for material treatment plant. 4,409,096., Cl. 209-10.000.

Ocean Ecology Ltd.: *See*—
Koblanski, John N., 4,408,494., Cl. 73-646.000.

Ogasawara, Satoru, to Fuji Xerox Co., Ltd. Method and apparatus for information reading in original document readers. 4,409,625., Cl. 358-288.000.

Ogata, Yoshihiro; Sakamoto, Koji; Takahashi, Harumi; and Hirakura, Koji, to Ricoh Company, Ltd. Transfer medium separating device. 4,408,863., Cl. 355-3.0TR.

Ogawa Chemical Industries, Ltd.: *See*—
Nagai, Masahiko, 4,408,921., Cl. 401-198.000.

Ogawa, Hiroshi; Kasuga, Akira; Tamai, Yasuo; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,409,291., Cl. 428-425.900.

Ogawa, Ryota: *See*—
Arai, Yasunori; and Ogawa, Ryota, 4,408,841., Cl. 350-425.000.

Ohashi, Junichi, to Toyo Rubber Industry Co., Ltd., The. Tubeless radial ply tire for heavy-duty vehicles. 4,408,648., Cl. 152-353.00C.

Ohba, Hiroshi; and Wakamatsu, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Drilling machine. 4,408,934., Cl. 408-51.000.

Ohba, Yasuhiro: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Ohi, Kunio: *See*—
Furuta, Naofumi; and Ohi, Kunio, 4,409,473., Cl. 250-206.000.

Ohkawa, Takehisa; and Yoda, Kuniichi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,409,300., Cl. 428-695.000.

Ohmi, Atsushi: *See*—
Nishii, Michiharu; and Ohmi, Atsushi, 4,409,460., Cl. 219-93.000.

Ohmura, Haruo: *See*—
Tomita, Tamaki; Nakao, Hisaji; Nishimura, Hideo; Eto, Kunihiko; and Ohmura, Haruo, 4,408,933., Cl. 408-8.000.

Ohta, Hiroshi: *See*—
Enomoto, Hiromu; Mitono, Yoshiharu; Yasuda, Yasushi; Imaizumi, Taketo; and Ohta, Hiroshi, 4,409,495., Cl. 307-290.000.

Ohyama, Kunio: *See*—
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.

Oil Dynamics, Inc.: *See*—
Wilson, Brown L.; and Carle, Joseph T., 4,409,504., Cl. 310-87.000.

Oita, Jack I., to Standard Oil Company (Indiana). Method of analysis for determining very low sulfur levels in volatilizable samples. 4,409,336., Cl. 436-123.000.

Oka, Kozo, to Fuji Xerox Co., Ltd. Electrophotographic light-sensitive element. 4,409,309., Cl. 430-65.000.

Okamoto, Takaaki: *See*—
Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.

Okamura, Yuichi; and Komatsu, Akitoshi, to Tokyo Kikai Seisakusho Ltd. Blanket tensioning system in press. 4,408,531., Cl. 101-415.100.

Okano, Kazumi; Nishigaki, Yuji; and Kasai, Masanao, to Canon Kabushiki Kaisha. Surface doped inorganic electrophotographic photosensitive particles in binder. 4,409,310., Cl. 430-95.000.

Okano, Shuji: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,409,282., Cl. 428-219.000.

Okano, Takeshi: *See*—
Takubo, Takayuki; and Okano, Takeshi, 4,409,619., Cl. 358-224.000.

OKI Electric Industry Co., Ltd.: *See*—
Akuta, Masajiro, 4,409,438., Cl. 179-18.0HB.
Masao, Sasaki, 4,408,910., Cl. 400-207.000.
Takayashiki, Tetsuya; Usui, Taiji; and Sakurai, Tetsuma, 4,408,386., Cl. 29-576.00E.

Oki, Takeo; and Hiraki, Isao, to Osaka Lead Refinery Co., Ltd. Method of collecting lead from ashes containing lead compounds. 4,409,072., Cl. 204-57.000.

Okosi, Yukio: *See*—
Miyazaki, Kunio; Okosi, Yukio; Kumagai, Akira; and Suzuki, Hitoshi, 4,409,079., Cl. 204-192.00C.

Olin Corporation: *See*—
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,409,085., Cl. 204-257.000.
Smith, Edward F., III; and Gyurina, F. Dennis, 4,409,295., Cl. 428-591.000.

Olympus Optical Co., Ltd.: *See*—
Kimura, Kenji, 4,409,472., Cl. 250-201.000.
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.
Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, 4,408,870., Cl. 355-14.0SH.
Sawaki, Ryoichi; and Kadota, Toshihiko, 4,409,634., Cl. 360-137.000.
Ueda, Yasuhiro, 4,408,598., Cl. 128-4.000.
Utsugi, Mikio, 4,408,612., Cl. 128-660.000.
Yamasaki, Masafumi, 4,408,852., Cl. 354-24.000.

Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, to Gruppo Lepetit S.p.A. 1,2,4-Triazole derivatives, and their use as antifertility agents. 4,409,388., Cl. 548-262.000.

Omura, Yoshiaki: *See*—
Mori, Fumio; and Omura, Yoshiaki, 4,409,238., Cl. 424-304.000.

OMYA GmbH: *See*—
Barthelmess, Ulrich, 4,409,097., Cl. 209-11.000.

Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., to Hoechst-Roussel Pharmaceuticals, Inc. Antidepressive and tranquilizing substituted 1,3-dihydrospiro[benzo(c)thiophene]s. 4,409,229., Cl. 424-267.000.

Onizawa, Takashi: *See*—
Matsui, Hiroshi; Sakami, Kazuo; Nishioka, Matsuo; and Onizawa, Takashi, 4,409,448., Cl. 200-153.0LA.

Ono, Hiroshi, to Gen Engineering Co., Ltd. Hearing aid suitable for use under noisy circumstance. 4,409,435., Cl. 381-71.000.

Onodera, Kaoru; Iijima, Toshifumi; and Fujimastu, Wataru, to Konishiroku Photo Industry Co., Ltd. Method for the reproduction of color image. 4,409,321., Cl. 430-383.000.

Onopchenko, Anatoli: *See*—
Swift, Harold E.; Innes, Robert A.; and Onopchenko, Anatoli, 4,409,399., Cl. 564-473.000.

Ooishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,408,733., Cl. 242-199.000.

Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Brush holder with coated clamp for dynamo-electric machine. 4,409,508., Cl. 310-239.000.

Oouchi, Keiji; Takoh, Isao; and Serizawa, Hisayuki, to Hitachi Heating Appliances Co., Ltd. High-frequency heating appliance. 4,409,452., Cl. 219-10.55E.

OPT Industries, Inc.: *See*—
Potash, Jerome, 4,409,569., Cl. 333-177.000.

Orain, Meidul, to Glaenzer Spicer. Articulation device for connecting a member to a shaft so that the member pivots and slides relative to the shaft. 4,408,806., Cl. 308-6.00R.

Orthoefer, Frank T.: *See*—
Lehnhardt, William F.; and Orthoefer, Frank T., 4,409,248., Cl. 426-46.000.

Osaka Lead Refinery Co., Ltd.: *See*—
Oki, Takeo; and Hiraki, Isao, 4,409,072., Cl. 204-57.000.

Osaka Transformer Co., Ltd.: *See*—
Yamamoto, Hideyuki; Nishikawa, Waichi; and Nagasaka, Moritoshi, 4,409,465., Cl. 219-137.0PS.

Osborne, Anne M. Card holding teaching device. 4,408,993., Cl. 434-430.000.

Oshima, Harumi, to Tokico Ltd. Disc brake. 4,408,681., Cl. 188-73.380.

Oshima, Yujiro: *See*—
Asai, Kiyokazu; Oshima, Yujiro; Takeuchi, Akihiro; and Tokoro, Hiroharu, 4,408,479., Cl. 73-35.000.

Oshiumi, Masaru: *See*—
Sakiyama, Kazuo; Kuwata, Mitsuo; and Oshiumi, Masaru, 4,409,077., Cl. 204-159.150.

Osman, Robert M., to Exxon Research & Engineering Co. Integrated cyclic scrubbing and condensate stripping process for the removal of gaseous impurities from gaseous mixtures. 4,409,191., Cl. 423-220.000.

Ouchi, Chiaki; and Sampei, Tetsuya, to Nippon Kokan Kabushiki Kaisha. Method of continuously casting nickel containing steel wherein surface cracks are prevented. 4,408,652., Cl. 164-459.000.

Outboard Marine Corporation: *See*—
Blanchard, Clarence E., 4,408,994., Cl. 440-53.000.

Ovshinsky, Stanford R.; and Madan, Arun, to Energy Conversion Devices, Inc. Amorphous semiconductors equivalent to crystalline semiconductors. 4,409,605., Cl. 357-2.000.

Owen, Thomas E.; Suhler, Sidney A.; and Peters, Wendell R., to United States of America, Air Force. Acoustic amplitude-threshold target ranging system. 4,408,533., Cl. 102-211.000.

Owens-Corning Fiberglas Corporation: *See*—
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,409,011., Cl. 65-27.000.

Owens-Illinois, Inc.: *See*—
Aust, John J., 4,408,710., Cl. 229-15.000.
Fillmore, William E.; Mumford, George V.; and Smalley, Ned J., 4,408,700., Cl. 222-153.000.
Miller, John W. V., 4,409,012., Cl. 65-29.000.
Mueller, Bruce, 4,408,694., Cl. 215-276.000.
Taylor, Randle W.; and Davey, Richard G., 4,409,014., Cl. 65-170.000.

Owens, Joe M. Advancement apparatus for concrete screed. 4,408,978., Cl. 425-456.000.

Oyler, John F., to Dravo Corporation. Circular traveling grate machine for process requiring minimum gas leakage. 4,408,987., Cl. 432-137.000.

Ozawa, Takashi: *See*—
Yagihara, Morio; Hirano, Tsumoru; Mihayashi, Keiji; and Ozawa, Takashi, 4,409,320., Cl. 430-381.000.

Ozeki, Fumitaka: *See*—
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.

Pacer Technology and Resources, Inc.: *See*—
Stock, Hugh J., 4,408,699., Cl. 222-149.000.

Packer, Martin R., to Liquid Dynamics, Inc. Hydropneumatic pulse interceptor. 4,408,635., Cl. 138-30.000.

Padovani, Pietro, to O.M.V. SpA. Process and apparatus for the manufacture of objects of crystalline polystyrene. 4,409,173., Cl. 264-210.200.

Paech, Ivor N., to Longyear Australia Pty. Ltd. Rotary seal apparatus with dual self-centering annular face seals. 4,408,766., Cl. 277-3.000.

Pai, Yang-Kuang. Manhole structure. 4,408,421., Cl. 52-20.000.

Paley, William S.: *See*—
Redmore, Derek; and Paley, William S., 4,409,151., Cl. 260-502.50E.

Palmer, Deryk J., to Nuway Manufacturing Company Limited. Mats. 4,408,365., Cl. 15-112.000.

Papantoniou, Christos: *See*—
Gaetani, Quintino; Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, 4,409,379., Cl. 526-230.500.

Papierok, Karl-Heinz: *See*—
Kummerling, Rolf; Poos, Robert; Pentzien, Thomas; and Papierok, Karl-Heinz, 4,408,477., Cl. 72-478.000.

Pappalardo, Massimo: *See*—
Assenza, Donello; and Pappalardo, Massimo, 4,409,510., Cl. 310-334.000.

Paquet, Andre J., to Hamon-Sobelco, S.A. Heating system for a steam turbine energy producing plant. 4,408,460., Cl. 60-678.000.

Parant, Jean-Paul, to Societe Anonyme dite Compagnie General d'Electricite. Vitreous material and semiconductor component incorporating same. 4,409,292., Cl. 428-428.000.

Park, Pyong K., to Ford Aerospace & Communications Corporation. Stripline slot array. 4,409,595., Cl. 343-771.000.

Parker, Ellery: *See*—
Cherukuri, Subraman R.; Friello, Dominick R.; Hopkins, Walter; Parker, Ellery; and Mackay, Donald A. M., 4,409,244., Cl. 426-5.000.

Parker, Ray A., Jr., to Phillips Petroleum Company. Apparatus for the recovery of thermoplastic from piping for reprocessing. 4,408,976., Cl. 425-301.000.

Parkins, Ian C. N. W., to Dow Mac Concrete Limited. Moulding reinforced concrete articles. 4,409,159., Cl. 264-39.000.

Parkison, Richard G.: *See*—
Swiers, Richard H.; and Parkison, Richard G., 4,408,745., Cl. 251-357.000.

Parry, John, to South Wales Switchgear Limited. Electrical switchgear. 4,409,446., Cl. 200-147.00R.

Parve, Toomas E.: *See*—
Min, Mart V.; Parve, Toomas E.; Khyarm, Khyarmo E.; and Pungas, Toom A., 4,409,555., Cl. 328-14.000.

Passafiume, Anthony; and Pieniak, Heinz A., to Johnson & Johnson Baby Products Company. Method and apparatus for effecting intermittent securement of a stretched elastic member to a moving web. 4,409,049., Cl. 156-164.000.

Pastor, Ricardo C.; Chew, Remedios K.; and Gorre, Luisa E., to Hughes Aircraft Company. Process for low-temperature surface layer oxidation of a semiconductor substrate. 4,409,260., Cl. 427-82.000.

Paszner, Laszlo; and Chang, Pei-Ching, to Thermoform Bau-Und Forschungsgesellschaft. Organosolv delignification and saccharification process for lignocellulosic plant materials. 4,409,032., Cl. 127-37.000.

Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,409,365., Cl. 525-78.000.

Pathfinder Auto Lamp Company: *See*—
Graff, Henry W.; and Erickson, Lloyd A., 4,408,939., Cl. 411-112.000.

Patton, Willard T.; and Mason, Robert J., to RCA Corporation. Coaxial line to waveguide coupler. 4,409,566., Cl. 333-26.000.
Pauli, Klaus H.: *See*—
Lenski, Ralph; Peiler, Rolf W.; and Pauli, Klaus H., 4,408,947., Cl. 414-526.000.
Paxson, Timm E., to Shell Oil Company. Asymmetric hydrogenation of tetra-substituted olefinic acids and derivatives. 4,409,397., Cl. 562-496.000.
Payer-Lux Elektroprodukte Gesellschaft m.b.H.: *See*—
Naimer, Gundolf, 4,408,392., Cl. 30-34.100.
Payne, John C.: *See*—
Latos, Edwin J.; and Payne, John C., 4,409,121., Cl. 252-389.00A.
Peabody Coal Company: *See*—
Smith, Jimmy B., 4,409,067., Cl. 201-1.000.
Peabody Spunstrand, Inc.: *See*—
Littrell, J. Kerry, 4,408,679., Cl. 181-243.000.
Peacock, Roy N., to HPS Corporation. Gate stop valve. 4,408,634., Cl. 137-630.120.
Peck, Timothy R.: *See*—
Belcher, Samuel L.; Peck, Timothy R.; and Smith, Roger D., 4,409,455., Cl. 219-10.810.
Pehr, Harald, to Pehr Holding Gesellschaft. Lightweight construction element. 4,409,271., Cl. 428-71.000.
Pehr Holding Gesellschaft: *See*—
Pehr, Harald, 4,409,271., Cl. 428-71.000.
Peiler, Rolf W.: *See*—
Lenski, Ralph; Peiler, Rolf W.; and Pauli, Klaus H., 4,408,947., Cl. 414-526.000.
Penkauskas, Thomas P.: *See*—
Andersen, Steven C.; Penkauskas, Thomas P.; Kassel, James W.; and Newcomer, Stephen O., 4,409,656., Cl. 364-200.000.
Pennwalt Corporation: *See*—
Bertell, Jerome W., 4,409,113., Cl. 252-42.000.
Pentzien, Thomas: *See*—
Kummerling, Rolf; Poos, Robert; Pentzien, Thomas; and Papierok, Karl-Heinz, 4,408,477., Cl. 72-478.000.
Performance Industries, Inc.: *See*—
Boyesen, Eyvind, 4,408,674., Cl. 180-227.000.
Perkin-Elmer Corp., The: *See*—
Quick, Donald L., 4,409,087., Cl. 204-298.000.
Perkins, David J. B.: *See*—
Holroyd, Eric; and Perkins, David J. B., 4,409,059., Cl. 156-397.000.
Perkins, J. E. Steven, to Philip Morris Incorporated. Vibratory pneumatic tobacco feeder. 4,408,619., Cl. 131-108.000.
Perrig, Max, to Sandoz Ltd. Process for dyeing cotton with reactive dyes in weakly alkaline dye-bath(pH 8.0–8.8). 4,408,997., Cl. 8-532.000.
Perry, Fred E.: *See*—
Bloom, Hanley D.; Bloom, Stanley; Perry, Fred E.; and Leone, Sam, 4,408,407., Cl. 40-607.000.
Peschl, Ivan A. S. Z. Universal blending silo. 4,408,889., Cl. 366-113.000.
Peters, Kenneth D., to UOP Inc. Catalytic reforming process. 4,409,095., Cl. 208-134.000.
Peters, Wendell R.: *See*—
Owen, Thomas E.; Suhler, Sidney A.; and Peters, Wendell R., 4,408,533., Cl. 102-211.000.
Peters, William A.: *See*—
Longwell, John P.; and Peters, William A., 4,409,094., Cl. 208-121.000.
Petersen, Alfred W., to Stauffer Chemical Company. Method of separating magnesium from wet process superphosphoric acid. 4,409,194., Cl. 423-321.00R.
Petersen, Christian C., to Polaroid Corporation. Electric motor having improved operating characteristics. 4,409,505., Cl. 310-90.000.
Petersen, Christian C., to Polaroid Corporation. Method and apparatus which change magnetic forces of a linear motor. 4,409,576., Cl. 335-170.000.
Petersen, Tommy: *See*—
Berth, Jorgen; Hansen, Erling; Heaven, Malcolm D.; and Petersen, Tommy, 4,409,177., Cl. 264-531.000.
Peterson, William E., to Rockwell International Corporation. Directional ultrasonic transducers. 4,408,493., Cl. 73-643.000.
Petrolite Corporation: *See*—
Redmore, Derek; and Paley, William S., 4,409,151., Cl. 260-502.50E.
Petruck, Gerd-Michael; and Wambach, Paul R., deceased (by Wambach, Christa, heiress), to Bayer Aktiengesellschaft. Process for the preparation of 1,3,5-trichlorobenzene. 4,409,407., Cl. 570-202.000.
Petz, Gunter. System for connecting the edge areas of thin-walled bodies. 4,408,787., Cl. 285-305.000.
Peuker, Karl, to Fag Kugelfischer Georg Schafer & Co. Method of and device for determining the boiling point of a liquid. 4,408,902., Cl. 374-27.000.
Pez, Guido P., to Allied Corporation. Process of hydrogenating benzenes and group IVa metal hydride catalysts therefor. 4,409,411., Cl. 585-275.000.
Pfahler, Gerhard: *See*—
Wiezer, Hartmut; and Pfahler, Gerhard, 4,409,348., Cl. 524-100.000.
Pfalzgraf, Manfred; Kern, Eckhart; and Collonia, Harald, to VDO Adolf Schindling AG. Device for controlling the speed of travel and regulating the idling speed of automotive vehicles with an Otto engine. 4,408,581., Cl. 123-339.000.
PHB Weserhutte Aktiengesellschaft: *See*—
Wenzel, Jurgen-Michael; Guderley, Werner; and Hamel, Ernst, 4,408,945., Cl. 414-325.000.
Phelps, Paul S. Disassemblable jack knife. 4,408,394., Cl. 30-157.000.
Philip Morris Incorporated: *See*—
Perkins, J. E. Steven, 4,408,619., Cl. 131-108.000.
Phillips, Bobby M., to Eastman Kodak Company. Spinneret orifice cross-sections. 4,408,977., Cl. 425-382.200.
Phillips, John H.: *See*—
Morrison, Lowen R., Jr.; Elder, Melisse N.; and Phillips, John H., 4,409,253., Cl. 426-424.000.
Phillips Petroleum Company: *See*—
Hatcher, Charles S.; and Smith, Kenneth E., 4,408,376., Cl. 28-245.000.
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Murtha, Timothy P., 4,409,401., Cl. 568-362.000.
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Phillips, Terence M.: *See*—
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Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,409,235., Cl. 424-273.00R.
Pickering & Company, Inc.: *See*—
Hofer, Alan; and Yama, Frank M., 4,409,588., Cl. 340-384.00R.
Pieniak, Heinz A.: *See*—
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Pierre Fabre S.A.: *See*—
Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, 4,409,241., Cl. 424-324.000.
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Pioneer Electronic Corporation: *See*—
Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, 4,409,436., Cl. 381-15.000.
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Yarm, Jay M., 4,408,757., Cl. 271-311.000.
Pittman, John B., to Brunswick Corporation. Anti-reverse actuator mechanism. 4,408,728., Cl. 242-84.20A.
Plancon, Marcel: *See*—
Fromont, Jacques; and Plancon, Marcel, 4,408,470., Cl. 72-8.000.
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Plastona (John Waddington) Ltd: *See*—
Ward, Peter, 4,409,178., Cl. 264-544.000.
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Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,409,176., Cl. 264-527.000.
Plummer, Walter A., III. Radio frequency shielding jacket for multiple ribbon cables. 4,409,427., Cl. 174-36.000.
Pochan, Darlyn F.: *See*—
Swigert, J. Kirk; and Pochan, Darlyn F., 4,409,598., Cl. 346-74.200.
Pocock, John F. E.: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,409,161., Cl. 264-40.100.
Podell, Allen F., to Cuisinarts, Inc. Motor speed control circuit providing armature current sensing and feedback action for each half cycle and control circuit reducing energy consumption of induction motors when running under no load and light loading. 4,409,528., Cl. 318-345.00D.
Poe, David T., to General Motors Corporation. Venting system for electric storage battery. 4,409,302., Cl. 429-88.000.
Pohl, Karl-Heinz, to Siemon Company, The. Conductor insertion tool and method. 4,408,391., Cl. 29-861.000.
Polaroid Corporation: *See*—
Murray, Joseph E., Jr.; and Sylvester, Paul J., 4,409,441., Cl. 179-111.00R.
Petersen, Christian C., 4,409,505., Cl. 310-90.000.
Petersen, Christian C., 4,409,576., Cl. 335-170.000.
Pollard, John K., Jr., to American Hoechst Corporation. Material and method for removing immunoglobulins from whole blood. 4,409,330., Cl. 435-178.000.
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Bartholdsten, Dieter; Koop, Hermann; Schrode, Erhard; and Zielasek, Adelbert, 4,409,169., Cl. 264-107.000.

Pommer, Ernst-Heinrich: *See—*
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Pooch, Gerhard; and von der Neyen, Hans-Juergen, to Siemens Aktiengesellschaft. Circuit for synchronizing a transmitting-receiving station to a data network of a digital communication system. 4,409,684., Cl. 375-116.000.

Poos, Robert: *See—*
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Ports, Kenneth A.; and Harlow, Justin E., to Harris Corporation. Method of serialization of dice. 4,409,686., Cl. 382-8.000.

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Nuckel, Klaus; and Schleuchardt, Manfred, 4,408,524., Cl. 101-110.000.

Potash, Jerome, to OPT Industries, Inc. Filter circuits having transformers as filter elements. 4,409,569., Cl. 333-177.000.

Potts, Mack F.: *See—*
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PPG Industries, Inc.: *See—*
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PQ Corporation: *See—*
Spivak, Bruce D., 4,409,158., Cl. 264-8.000.

President and Fellows of Harvard College: *See—*
Fossel, Eric T.; and Delayre, Jean L., 4,409,550., Cl. 324-300.000.

Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., to Gulf Research & Development Company. Process for producing ethanol using said novel catalyst system. 4,409,404., Cl. 568-902.000.

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Price, Anthony G.: *See—*
Edwards, Roy E.; and Price, Anthony G., 4,408,805., Cl. 303-6.00A.

Price, William F., Sr. Flip-flop turbine vane module. 4,408,956., Cl. 416-119.000.

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Professional Staff Association of the Rancho Los Amigos Hospital, Inc.: *See—*
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Profio, Mark V.; Libert, James T.; and Kampf, Julian C., to Square D Company. Abort cycle timer. 4,409,640., Cl. 361-197.000.

Profitt, James A.: *See—*
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., 4,409,229., Cl. 424-267.000.

Promagco Limited: *See—*
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Propster, Mark A.: *See—*
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,409,011., Cl. 65-27.000.

Pugh, Paul F. Method for transporting low temperature heat long distances. 4,408,657., Cl. 165-1.000.

Puls, Norman M., to Magnum Division of Tandon Corporation. Mechanism for centering and clamping a floppy disc. 4,409,629., Cl. 360-99.000.

Pungas, Toom A.: *See—*
Min, Mart V.; Parve, Toomas E.; Khyarm, Khyarmo E.; and Pungas, Toom A., 4,409,555., Cl. 328-14.000.

Pusterhofer, Ronald J., to Advance Brushes, Inc. End brush. 4,408,367., Cl. 15-180.000.

Putnam, Alan R.: *See—*
Lehle, Fredric R.; Maine, James W.; Grossman, David; Leavitt, Richard A.; and Putnam, Alan R., 4,408,414., Cl. 47-1.00R.

Qualeatti, Gail M.; and Germanas, Dalia, to UOP Inc. Process for the reduction of unsaturated carboxylic acids. 4,409,148., Cl. 260-409.000.

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Quay, Earl R., to Mayer, Rothkopf Industries, Inc. Self-cleaning doffer wire. 4,408,371., Cl. 19-114.000.

Quick, Donald L., to Perkin-Elmer Corp., The. Wafer detection circuitry for high vacuum use. 4,409,087., Cl. 204-298.000.

Quietlite International, Inc.: *See—*
Elliott, William J., 4,409,522., Cl. 315-308.000.

Qvarnstrom, Bengt G. L., to Stora Kopparbergs Bergslags Aktiebolag. Method for transplanting of seedlings. 4,408,549., Cl. 111-2.000.

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Detterman, Don E.; Danhoff, Ronald S.; and Wheeler, William E., 4,408,780., Cl. 281-15.00R.

Raab, Alfred: *See—*
Cohen, Carlos; and Raab, Alfred, 4,408,721., Cl. 239-417.000.

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Rach, Heinz-Dieter: *See—*
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Ragan, Marshall P., to FMC Corporation. Beam projector for wheel aligner. 4,408,879., Cl. 356-155.000.

Raines, Charles D.: *See—*
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Rajendren, Richard B., to Aeration Industries, Inc. Liquid aerating device. 4,409,100., Cl. 210-219.000.

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Ramsey, Arlie A.: *See—*
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Randolph, Travis M.; and Schreiner, Charles P. Three wheel vehicle. 4,408,776., Cl. 280-261.000.

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Rapson, W. Howard: *See—*
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Rasberger, Michael, to Ciba-Geigy Corporation. Compositions stabilized by 6-amino-dibenz[d,g][1,3,2]dioxaphosphocines. 4,409,346., Cl. 524-83.000.

Rasch, Arthur A.: *See—*
Lelental, Mark; Rasch, Arthur A.; and Sullivan, David P., 4,409,307., Cl. 430-31.000.

Raskin, S.A.: *See—*
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Raskob, Richard L. Two-wheel cart. 4,408,774., Cl. 280-47.260.

Rauch, Jeffrey S., to Mechanical Technolgy Incorporated. Free-piston Stirling engine power control. 4,408,456., Cl. 60-518.000.

Raychem A/S: *See—*
Berth, Jorgen; Hansen, Erling; Heaven, Malcolm D.; and Petersen, Tommy, 4,409,177., Cl. 264-531.000.

RCA Corporation: *See—*
Chase, Thomas L.; and Ehemann, George M., Jr., 4,408,851., Cl. 354-1.000.
D'Amato, Ralph J., 4,409,513., Cl. 313-348.000.
Ferguson, James M.; Chen, Thomas Y.; and Gibson, Walter G., 4,409,626., Cl. 358-338.000.
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Kleinknecht, Hans P.; Ham, William E.; and Meier, Heinrich, 4,408,884., Cl. 356-355.000.
Patton, Willard T.; and Mason, Robert J., 4,409,566., Cl. 333-26.000.
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Shefer, Joshua; and Catanese, Carmen A., 4,409,514., Cl. 313-449.000.
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Ready Brush, Inc.: *See—*
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Rebel, Herbert, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Arrangement for low-vibration sheet transfer between printing units on multi-color printing presses. 4,408,525., Cl. 101-183.000.

Redlich, Robert W. Instruments for measurement of carrier power and antenna impedance in AM broadcasting. 4,409,544., Cl. 324-57.00R.

Redmann, Jerry L., Jr.; and Gurney, Gerald W., to C. L. Frost & Son, Inc. Relubricatable double row bearing. 4,408,808., Cl. 308-187.000.

Redmore, Derek; and Paley, William S., to Petrolite Corporation. N,N-Dimethylene phosphonic acids of alkylene diamines. 4,409,151., Cl. 260-502.50E.

Reeve, Douglas W.; and Rapson, W. Howard, to Erco Industries Limited. Bleaching procedure using chlorine dioxide and chlorine solutions. 4,409,066., Cl. 162-88.000.

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Reidy, John J.: *See—*
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Relyea, Richard D., to Aerobitronics, Inc. Interactive exercise device. 4,408,613., Cl. 128-670.000.

Relyea, Richard D.: *See—*
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Renz, Klaus: *See—*
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Research Corporation: *See*—
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Research Corporation of the University of Hawaii: *See*—
Heinicke, Ralph M., 4,409,144., Cl. 260-236.500.
Research Council of Alberta: *See*—
Kessick, Michael A., 4,409,091., Cl. 208-11.0LE.
Reumann, Franz, to Internationale Patente Verwertungsgesellschaft m.b.H. Process and apparatus for magnetizing, on both sides, the surfaces of bodies to be magnetized. 4,409,581., Cl. 335-284.000.
Reuter, Alfred, to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck". Apparatus for cutting boards from tree trunks. 4,408,510., Cl. 83-869.000.
Revlon, Inc.: *See*—
Meyerhoefer, Carl H.; and Meyerhoefer, Carl E., 4,408,622., Cl. 132-73.000.
Rewitzer, Siegfried, to Hoechst Aktiengesellschaft. Process and apparatus for pressing, packing and hooping fibrous material in bale form. 4,408,438., Cl. 53-438.000.
Reynolds Metals Company: *See*—
Moore, Thomas W., 4,409,021., Cl. 75-10.00R.
Rheological Systems, Inc.: *See*—
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Rhodes, Edward: *See*—
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Lagarde, Robert; and Vrisakis, Georges, 4,409,356., Cl. 524-492.000.
Rhone-Poulenc-Textile: *See*—
Menault, Jacques; and Rodier, Henry, 4,409,289., Cl. 428-374.000.
Riblet, Leslie A.; and Eison, Michael S. Anxiolytic method. 4,409,223., Cl. 424-251.000.
Ricard, Claude F. Methods and taximeters for calculating a taxi fare. 4,409,685., Cl. 377-20.000.
Ricaud, Pierre, to Societe Nationale Industrielle Aerospatiale. Process and device for the derivation of an analog electric signal. 4,409,667., Cl. 364-732.000.
Rice, William T., III, to Luwa A.G. Motionless mixing device. 4,408,893., Cl. 366-339.000.
Richards, John S.; and DePaoli, Alan G., to Information International, Inc. Method and apparatus for compacting and decompacting character in accordance with a variety of methods. 4,409,621., Cl. 358-260.000.
Richards, Raymond G., to PPG Industries, Inc. Method of and apparatus for determining continuity of an electrical conductor. 4,409,541., Cl. 324-51.000.
Richardson, Frank; and Campbell, Allan H., to Twin-Cee Limited. Wall mounted paper towel handling unit. 4,408,811., Cl. 312-37.000.
Richmond, James M., to Akzona Incorporated. Fabric softening compounds and method. 4,409,109., Cl. 252-8.800.
Rickard, Jimmy R.: *See*—
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Ries, Gunter, to Siemens Aktiengesellschaft. Cryogenically stabilized superconductor in cable form for large currents and alternating field stresses. 4,409,425., Cl. 174-15.00S.
Rieter Machine Works Limited: *See*—
Schenkel, Eduard, 4,408,731., Cl. 242-131.000.
Rinehart, John R. Taxidermy fish body insert piece and method of making it. 4,408,992., Cl. 434-296.000.
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Weber, Ralph; Rollinger, Bernt; Hauk, Rolf; Nagl, Michael; and Rinner, Bernhard, 4,409,023., Cl. 75-38.000.
Riom Laboratories - Cerm S.A.: *See*—
Combourieu, Michel; Laigle, Jean-Claude; and Busch, Norbert, 4,409,221., Cl. 424-250.000.
Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. GnRH antagonists. 4,409,208., Cl. 424-177.000.
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Jakob, Gert; Gansert, Willi; Goetzke, Siegfried; and Ruttkowski, Lothar, 4,409,641., Cl. 361-386.000.
Leiber, Heinz, 4,408,673., Cl. 180-141.000.
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Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,408,695., Cl. 220-3.300.
Robinson, David E.: *See*—
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Robinson, Morris D. Controlled-folding and controlled-unfolding multiple section platform assembly. 4,408,948., Cl. 414-545.000.
Robinson, Richard C.; and Hecker, William C., to Chevron Research Company. Process for regenerating sulfur sorbent by oxidation and leaching. 4,409,124., Cl. 502-5.000.
Rochon, Robert W.; and Sneed, Joe W., Jr., to Monarch Logging Company, Inc. Bell nipple densitometer method and apparatus. 4,408,486., Cl. 73-155.000.
Rockwell International Corporation: *See*—
Marshall, Claude J., Jr., 4,408,804., Cl. 301-37.00R.
Peterson, William E., 4,408,493., Cl. 73-643.000.
Rockwell, Leon G. Flue gas heat recovery system. 4,408,716., Cl. 237-55.000.
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Rogers, Ralph W., Jr.: *See*—
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,409,036., Cl. 148-2.000.
Rogers, William H., to Rogers Holster Co., Inc. Revolver reloader holster. 4,408,707., Cl. 224-239.000.
Rohner, Joachim, to W. Schlafhorst & Co. Method and device for joining an upper thread to a lower thread. 4,408,442., Cl. 57-22.000.
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Roman, Steven A., to Shell Oil Company. Preparation of (1R, cis)-oxyimino-substituted cyclo-propanecarboxylic acids. 4,409,398., Cl. 562-506.000.
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Long, William D.; and Rottenkolber, Paul J., 4,408,959., Cl. 416-241.00B.
Rottmaier, Ludwig; Merten, Rudolf; Tima, Milan J.; and Michael, Dietrich, to Bayer Aktiengesellschaft. Flame-proof polyamide moulding compositions. 4,409,347., Cl. 524-91.000.
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Rowley, Edward K.: *See*—
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Roy, Jean-Joseph: *See*—
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RPC Industries: *See*—
Loda, Gary K.; and Farrell, Sherman R., 4,409,511., Cl. 313-34.000.
Ruckert, Hans: *See*—
Buhr, Gerhard; Ruckert, Hans; and Stahlhofen, Paul, 4,409,314., Cl. 430-192.000.
Rud. Biere Maschinen Und Apparatebau AG: *See*—
Bieri, Rudolf, 4,408,688., Cl. 198-500.000.
Rudnick, Leslie R., to Mobil Oil Corporation. Coal liquefaction and resid processing with lignin. 4,409,089., Cl. 208-8.0LE.
Rumennik, Vladimir, to Xerox Corporation. Normally-on enhancement mode MOSFET with negative threshold gating. 4,409,607., Cl. 357-23.000.
Russell, David B., to Dennison Manufacturing Company. Apparatus for stretching of fasteners. 4,408,979., Cl. 425-383.000.

Russell, Ingeborg: *See*—
Stewart, Graham G.; Goring, Thomas E.; and Russell, Ingeborg, 4,409,246., Cl. 426-16.000.

Ruttkowski, Lothar: *See*—
Jakob, Gert; Gansert, Willi; Goetzke, Siegfried; and Ruttkowski, Lothar, 4,409,641., Cl. 361-386.000.

Ryan, Edward J., to United Technologies Corporation. Method for applying abradable material to a honeycomb structure and the product thereof. 4,409,054., Cl. 156-293.000.

Ryer, Jack: *See*—
Brois, Stanley J.; Gutierrez, Antonio; and Ryer, Jack, 4,409,114., Cl. 252-75.000.

Rynberk, Robert W., to Valley View Specialties Co. Fountain construction with lighting means. 4,408,717., Cl. 239-18.000.

SAB Industri AB: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,408,682., Cl. 188-202.000.

SACE S.p.A. Costruzioni Elettromeccaniche: *See*—
Mostosi, Angelo, 4,409,572., Cl. 335-8.000.

Sacilor Acieries et Laminoirs de Lorraine: *See*—
Mennel, Gabriel B., 4,408,475., Cl. 72-221.000.

Sailor Pen Co., Ltd., The: *See*—
Tanaka, Toshiaki, 4,408,973., Cl. 425-139.000.

Saimbi, Manjit S.: *See*—
Masters, Jeffrey; Saimbi, Manjit S.; and Webb, Roger J., 4,408,983., Cl. 431-116.000.

Saito, Etsuro, to Sony Corporation. Information signal recording and/or reproducing apparatus and a recording jacket for use therewith. 4,409,630., Cl. 360-99.000.

Saitoh, Masaaki; and Kameoka, Michitada, to Honda Giken Kogyo Kabushiki Kaisha. Hinge device for a detachable roof panel in an automobile. 4,408,795., Cl. 296-218.000.

Sakaguchi, Haruo; Seki, Norio; Yamamoto, Shu; and Wakabayashi, Hiroharu, to Kokusai Denshin Denwa Co., Ltd. Optical switch. 4,408,831., Cl. 350-269.000.

Sakaguchi, Hiroo: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,408,752., Cl. 269-8.000.

Sakai, Kazushige: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Sakakibara, Shiro; Maseki, Shinobu; Watanabe, Kazuaki; and Minemoto, Isamu, to Aisin Warner Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Pressure regulating device for use in an automatic transmission. 4,408,462., Cl. 60-330.000.

Sakami, Kazuo: *See*—
Matsui, Hiroshi; Sakami, Kazuo; Nishioka, Matsuo; and Onizawa, Takashi, 4,409,448., Cl. 200-153.0LA.

Sakamoto, Koji: *See*—
Ogata, Yoshihiro; Sakamoto, Koji; Takahashi, Harumi; and Hirakura, Koji, 4,408,863., Cl. 355-3.0TR.

Sakaoka, Hiromu, to Honda Giken Kogyo Kabushiki Kaisha. Intake system of an internal combustion engine. 4,408,576., Cl. 123-52.0MB.

Sakata Shokai, Ltd.: *See*—
Sakiyama, Kazuo; Kuwata, Mitsuo; and Oshiumi, Masaru, 4,409,077., Cl. 204-159.150.

Sakiyama, Kazuo; Kuwata, Mitsuo; and Oshiumi, Masaru, to Sumitomo Chemical Co., Ltd.; and Sakata Shokai, Ltd. Ultraviolet radiation curable coating composition. 4,409,077., Cl. 204-159.150.

Sakudo, Noriyuki: *See*—
Koike, Hidemi; Sakudo, Noriyuki; Tokiguchi, Katsumi; and Kanomata, Ichiro, 4,409,520., Cl. 315-39.000.

Sakurai, Koichi: *See*—
Yokoyama, Hideo; Shimbashi, Ichiro; Sakurai, Koichi; and Matsuo, Munetsugu, 4,408,561., Cl. 118-72.000.

Sakurai, Tetsuma: *See*—
Takayashiki, Tetsuya; Usui, Taiji; and Sakurai, Tetsuma, 4,408,386., Cl. 29-576.00E.

Salikhov, Zufar G.; Ivanov, Vasily A.; Vyatchinov, Viktor P.; Maltsev, Vladimir I.; Grozdev, Sergei S.; and Khodov, Nikolai V., to Moskousky Institut Stali I Splavov. Fluidized bed apparatus. 4,409,101., Cl. 210-266.000.

Salk Institute for Biological Studies, The: *See*—
Ling, Nicholas C.; Guillemin, Roger C. L.; Ying, Shao-Yao; and Esch, Frederick S., 4,409,139., Cl. 260-112.00R.
Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,409,208., Cl. 424-177.000.

Salour, Michael M.; and Roxlo, Charles B., to United States of America, Air Force. Dewar cooling chamber for semiconductor platelets. 4,408,464., Cl. 62-514.00R.

Samejima, Yasushi: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kano, Toshiji; and Hatta, Yoshio, 4,409,074., Cl. 204-98.000.

Samowich, Joseph J. Decorative laminate. 4,409,275., Cl. 428-138.000.

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Ouchi, Chiaki; and Sampei, Tetsuya, 4,408,652., Cl. 164-459.000.

Sampson, John D.; and Sparrow, David J. W., to Coal Industry (Patents) Limited. Mixing equipment. 4,408,886., Cl. 366-13.000.

Sanders Associates, Inc.: *See*—
Carl, Norman J., 4,409,477., Cl. 250-227.000.
White, Ronald P., 4,409,681., Cl. 367-166.000.

Sandler, Stanley A.: *See*—
D'Alessio, Michael S.; and Sandler, Stanley A., 4,408,431., Cl. 52-690.000.

Sandoz Ltd.: *See*—
Perrig, Max, 4,408,997., Cl. 8-532.000.
Wicki, Heinz, 4,409,142., Cl. 260-160.000.

Sandrock, Gary D.; Huston, Ernest L.; and Liu, James, to MPD Technology Corporation. Process for manufacturing rare earth intermetallic hydridable compounds. 4,409,180., Cl. 420-455.000.

Sandvik Aktiebolag: *See*—
Wiredal, Harry A. I., 4,408,669., Cl. 175-258.000.

Sankyo Company, Limited: *See*—
Tsukada, Kazuhiro; and Kato, Wataru, 4,409,233., Cl. 424-273.00R.

Sanofi: *See*—
Nisato, Dino; and Carminati, Paolo, 4,409,228., Cl. 424-267.000.

Santee, Harold P., to Santee, Jack H.; Santee, Robert P.; and McAfee, Catherine A. Secondary oil recovery method. 4,408,664., Cl. 166-263.000.

Santee, Jack H.: *See*—
Santee, Harold P., 4,408,664., Cl. 166-263.000.

Santee, Robert P.: *See*—
Santee, Harold P., 4,408,664., Cl. 166-263.000.

Sarin, Vinod K.; and Buljan, Sergej-Tomislav, to GTE Laboratories Incorporated. Carbonitride coated silicon nitride cutting tools. 4,409,003., Cl. 51-295.000.

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Sarnoff, Stanley J., to Survival Technology, Inc. Emergency electrode. 4,408,610., Cl. 128-642.000.

Sasaya, Hideaki: *See*—
Inagaki, Mitsuo; Sasaya, Hideaki; and Ito, Seitoku, 4,408,968., Cl. 418-15.000.

Sasseen, Marvin W. Novelty item of a cigarette extinguishing ash tray. 4,408,620., Cl. 131-236.000.

Satchell, Donald P.: *See*—
Anderson, Mark A.; Balliett, Robert W.; Link, Paul E.; and Satchell, Donald P., 4,408,985., Cl. 432-1.000.

Sater, Bernard L. High intensity solar cell. 4,409,422., Cl. 136-244.000.

Sato, Mikio: *See*—
Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,408,840., Cl. 350-349.000.

Sato, Ryosuke; Hotta, Yuji; and Matsuura, Katsumi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,409,323., Cl. 430-544.000.

Sato, Tadao; Endo, Tadashi; Fukunaga, Osamu; and Iwata, Minoru, to National Institute for Researches in Inorganic Materials. Process for preparing cubic boron nitride. 4,409,193., Cl. 423-290.000.

Sattler, Heinrich: *See*—
Adrian, Fritz; Sattler, Heinrich; and Sauerland, Werner, 4,408,723., Cl. 241-19.000.

Sauer, Werner: *See*—
Franck, Klaus; Sauer, Werner; and Wiesmann, Herbert L., 4,408,797., Cl. 297-218.000.

Sauer, William F.: *See*—
Crouch, Bill W.; Sauer, William F.; and Zylka, Kenneth R., 4,408,437., Cl. 53-431.000.

Sauerland, Werner: *See*—
Adrian, Fritz; Sattler, Heinrich; and Sauerland, Werner, 4,408,723., Cl. 241-19.000.

Saura, Eiji: *See*—
Sugino, Morihiko; and Saura, Eiji, 4,409,284., Cl. 428-304.400.

Sauter, Robert: *See*—
Hurnaus, Rudolf; Griss, Gerhart; Sauter, Robert; Grell, Wolfgang; Kobinger, Walter; and Pichler, Ludwig, 4,409,220., Cl. 424-250.000.

Savidge, David H.: *See*—
Garner, Henry C.; Broadbent, Jack; Savidge, David H.; and Wadsworth, Eric, 4,409,549., Cl. 324-262.000.

Sawaki, Ryoichi; and Kadota, Toshihiko, to Olympus Optical Company Limited. Tape recorder. 4,409,634., Cl. 360-137.000.

Scandia Packaging Machinery Company: *See*—
Anderson, Andrew W., 4,408,439., Cl. 53-461.000.

Scandinavian Lancers Aktiebolag: *See*—
Andersson, Kjell; and Forsell, Ragnar, 4,408,750., Cl. 266-216.000.

Schacle, Charles V., to Bendix Corporation, The. Wind turbine blade. 4,408,958., Cl. 416-237.000.

Schaich, Josef. Method and apparatus for forming fuel-air mixture in an internal combustion engine. 4,408,574., Cl. 123-26.000.

Schaper, Helmut, to Braunschweigische Maschinenbauanstalt AG. Continuously operable sugar centrifugal and method for improving the purity of the produced sugar. 4,409,031., Cl. 127-19.000.

Schaper, Siegfried; Wimmer, Anton; and Dommes, Werner, to Audi NSU Auto Union Aktiengesellschaft. Method for making connecting rods for internal combustion engines. 4,408,380., Cl. 29-156.50A.

Scheef, Hans-Volker: *See*—
Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., 4,409,421., Cl. 585-833.000.

Scheid, Peter; and Slama, Heinrich, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Stabilization control for a mass spectrometer. 4,409,482., Cl. 250-282.000.

Schelli, William; and Sindelar, William E., to Danly Machine Corporation. Power press with automatic die changing system. 4,408,521., Cl. 100-229.00R.

Schenkel, Eduard, to Rieter Machine Works Limited. Creel for a spinning machine. 4,408,731., Cl. 242-131.000.
Scherer, Erich. Circuit arrangement for producing a low frequency alternating current. 4,409,565., Cl. 331-40.000.
Schering AG: *See*—
Goldmann, Helmut, 4,409,082., Cl. 204-213.000.
Schering Corporation: *See*—
Bristol, James A.; and Lovey, Raymond G., 4,409,226., Cl. 424-256.000.
Scherrer, Fernand. Section constituting an outer longitudinal element or moulding of a false ceiling or a false wall. 4,408,433., Cl. 52-738.000.
Schill, Herman, to Maja Maschinenfabrik Hermann Schill GmbH. Apparatus for slicing bacon or the like. 4,408,519., Cl. 99-486.000.
Schilling, Hugh K.; and Raines, Charles D., to Horton Industries, Inc. Fluid set and spring released clutch. 4,408,685., Cl. 192-85.00A.
Schippers, Heinz, to Barmag Barmer Maschinenfabrik AG. Stuffing chamber texturizing process. 4,408,377., Cl. 28-250.000.
Schippers, Heinz: *See*—
Bauer, Karl; Schippers, Heinz; and Dammann, Peter, 4,408,449., Cl. 57-340.000.
Schirk, Gunter; and Kastl, Alfons, to Agfa-Gevaert AG. Arrangement for developing photographic layer carriers. 4,408,891., Cl. 366-265.000.
Schleppinghoff, Bernhard: *See*—
Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., 4,409,421., Cl. 585-833.000.
Schleuchardt, Manfred: *See*—
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Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,409,358., Cl. 524-547.000.
Schlueter, William B.; and Debuque, Ignacio D., Jr. System and method for superheated-water injection system (SWIS). 4,408,573., Cl. 123-25.00P.
Schlumberger Technology Corporation: *See*—
Fitzgerald, Robert W., Jr.; Hall, Robert L.; and Bickford, Gary P., 4,408,829., Cl. 350-96.290.
McGill, Howard L., 4,408,485., Cl. 73-155.000.
Schlutter, A.: *See*—
Schmalfeld, Jorg; Bruckner, Werner; Jacobs, Jorn; Greulich, H. S.; and Schlutter, A., 4,408,548., Cl. 110-347.000.
Schmalfeld, Jorg; Bruckner, Werner; Jacobs, Jorn; Greulich, H. S.; and Schlutter, A. Pulverized coal combustion method and apparatus. 4,408,548., Cl. 110-347.000.
Schmelzer, Henry. Homogeneous blends of a trans-isomer of polyisoprene. 4,409,366., Cl. 525-221.000.
Schmidhammer, Ludwig: *See*—
Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, 4,409,396., Cl. 560-245.000.
Schmidt, Jacob D. Hingeless safe door assembly. 4,408,546., Cl. 109-75.000.
Schmidt, Karl-Heinz: *See*—
Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, 4,409,396., Cl. 560-245.000.
Schmidt, Willi: *See*—
Hutzenlaub, Armin S. P.; and Schmidt, Willi, 4,408,474., Cl. 72-205.000.
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, to Chemplex Company. Adhesive blends and composite structures comprising acid or anhydride modified PE + hope + polypropylene. 4,409,364., Cl. 525-74.000.
Schnathorst, Vernon K.; and Bastian, Gary T., to NCR Corporation. High speed write control for synchronous registers. 4,409,680., Cl. 365-233.000.
Schoeffler, William N. Impact cam subassembly for drills. 4,408,670., Cl. 175-298.000.
Scholl, Albert S. Trim knife. 4,408,396., Cl. 30-294.000.
Schoolman, Arnold. Eyeglass frame with structural spare key. 4,408,844., Cl. 351-158.000.
Schott, Lawrence A. AC Frequency and phase synchronizer. 4,409,491., Cl. 307-77.000.
Schreiner, Charles P.: *See*—
Randolph, Travis M.; and Schreiner, Charles P., 4,408,776., Cl. 280-261.000.
Schrode, Erhard: *See*—
Bartholdsten, Dieter; Koop, Hermann; Schrode, Erhard; and Zielasek, Adelbert, 4,409,169., Cl. 264-107.000.
Schroder, Beverly, personal representative: *See*—
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Schroder, Billy D., deceased: *See*—
Schroder, Leonard E.; Schroder, Leonard D.; Schroder, Billy D., deceased; and Schroder, Beverly, personal representative, 4,409,104., Cl. 210-673.000.
Schroder, Leonard D.: *See*—
Schroder, Leonard E.; Schroder, Leonard D.; Schroder, Billy D., deceased; and Schroder, Beverly, personal representative, 4,409,104., Cl. 210-673.000.
Schroder, Leonard E.; Schroder, Leonard D.; Schroder, Billy D., deceased; and by Schroder, Beverly, personal representative. Method of regenerating molecular sieve material. 4,409,104., Cl. 210-673.000.
Schroeder, Manfred: *See*—
Coenen, Alfred; Schroeder, Manfred; and Prominski, Guenter, 4,409,198., Cl. 423-462.000.
Schuch, Gerhard: *See*—
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,409,542., Cl. 324-57.00Q.
Schultz, Ward E.: *See*—
Smith, Harry D., Jr.; Schultz, Ward E.; and Verbout, Jerry L., 4,409,481., Cl. 250-270.000.
Schulwitz, Bruno: *See*—
Herwig, Jens; Schulwitz, Bruno; Schleppinghoff, Bernhard; Scheef, Hans-Volker; and Lange, Peter M., 4,409,421., Cl. 585-833.000.
Schulz, Volkmar: *See*—
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Schumacher, Heinz: *See*—
Kraft, Helmut; Schumacher, Heinz; Pommer, Ernst-Heinrich; Schlotterbeck, Dietrich; and Ley, Gregor, 4,409,358., Cl. 524-547.000.
Schumacher, Peter, to Hauni-Werke Korber & Co. KG. Apparatus for transferring cigarettes or the like. 4,408,621., Cl. 131-282.000.
Schumann, Gunter: *See*—
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Jehring, Arnfried; and Liebschner, Fritz, 4,408,529., Cl. 101-415.100.
Schuster, Herbert: *See*—
Kohler, Armin; Schuster, Herbert; and Renner, Rudi, 4,409,187., Cl. 422-135.000.
Schwaerzler, Hans, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung. Method and apparatus enabling a horizontal landing of a flying body. 4,408,737., Cl. 244-110.00D.
Schwarzmann, Matthias: *See*—
Krabetz, Richard; Merger, Franz; and Schwarzmann, Matthias, 4,409,128., Cl. 502-211.000.
Schweinfurter, Friedrich. Lateral channel pump. 4,408,952., Cl. 415-53.00T.
Schwiebert, Erwin H.: *See*—
Camis, Thomas; Spencer, Paul R.; Schwiebert, Erwin H.; and Hay, Robert R., 4,408,865., Cl. 355-3.0CH.
Scifres, Donald R.: *See*—
Sprague, Robert A.; and Scifres, Donald R., 4,409,479., Cl. 250-237.00G.
Sciuto, Michael N. Stringed instrument conversion kit employing combined bridge/tuning mechanism. 4,408,515., Cl. 84-267.000.
Sclafani, Augustus: *See*—
Kirschbaum, Nathan; and Sclafani, Augustus, 4,408,736., Cl. 244-100.00R.
SCM Corporation: *See*—
Smith, Michael H., 4,408,915., Cl. 400-290.000.
Smith, Michael H., 4,408,918., Cl. 400-697.100.
Scott, Robert G., to United States of America, Air Force. Altimeter code converter. 4,409,587., Cl. 340-347.0DD.
Sea Energy Corporation: *See*—
Hagen, Glenn E.; and Gordon, Carroll K., 4,408,454., Cl. 60-500.000.
Sechi, Franco N., to RCA Corporation. Bandpass filter with an active element. 4,409,557., Cl. 330-277.000.
Seidel, Hartmut; and Hammerschmidt, Winrich B., to NATEC Institut. One-piece, washable and sterilizable plastic shoe. 4,408,401., Cl. 36-3.00B.
Seidel, William C.; and Staikos, Dimitri N., to Du Pont de Nemours, E. I., and Company. Indirect electrochemical furan synthesis. 4,409,076., Cl. 204-130.000.
Seiderman, Maurice. Ionically coagulated hydrophilic polyelectrolyte contact lens. 4,408,845., Cl. 351-160.00H.
Seki, Norio: *See*—
Sakaguchi, Haruo; Seki, Norio; Yamamoto, Shu; and Wakabayashi, Hiroharu, 4,408,831., Cl. 350-269.000.
Sekizawa, Hidekazu: *See*—
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Selbertinger, Ernst: *See*—
Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, 4,409,396., Cl. 560-245.000.
Semrow, Carolyn M.: *See*—
Sigel, Bernard; Semrow, Carolyn M.; Kolstedt, Mark W.; Arkans, Edward J.; and Kaczmarek, Lynn M., 4,408,692., Cl. 206-438.000.
Sen, Soumendranath: *See*—
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Seng, Stephen: *See*—
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Sentrol, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,409,577., Cl. 335-202.000.
Senyitko, Erwin J., to DBS, Inc. Electric imprinter with roller platen positional control. 4,408,523., Cl. 101-56.000.

Serban, Alexander; Bird, Graham J.; and Cross, Lindsay E., to ICI Australia Limited. Herbicidal isoquinolinoxy- or isoquinolinaminophenoxy alkane carboxylic acid derivatives. 4,409,017., Cl. 71-94.000.

Serizawa, Hisayuki: *See*—
Oouchi, Keiji; Takoh, Isao; and Serizawa, Hisayuki, 4,409,452., Cl. 219-10.55E.

Seshan, Srinivasachari: *See*—
Bhattacharyya, Dhirendra N.; Seshan, Srinivasachari; Campbell, John S.; and Sen, Soumendranath, 4,409,044., Cl. 149-2.000.

Setsune, Kentaro; and Tanaka, Toshihide, to Matsushita Electric Industrial Co., Ltd. Surface acoustic wave device. 4,409,567., Cl. 333-151.000.

Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., to SAB Industri AB. Rail vehicle slack adjuster. 4,408,682., Cl. 188-202.000.

Sexsmith, Frederick H.: *See*—
Zalucha, Denis J.; Sexsmith, Frederick H.; and Howard, Dennis D., 4,409,383., Cl. 528-499.000.

Shackelford, John T.: *See*—
Moss, Elvis W.; and Shackelford, John T., 4,408,729., Cl. 242-84.50A.

Shacter, Stuart B., to Motorali, Inc. Operational amplifier output stage driven by a single ended gain stage. 4,409,561., Cl. 330-300.000.

Shafley, William K.: *See*—
Williams, Harry S.; Yates, Jan B.; Reidy, John J.; Faccini, Ernest; Hill, Terry E.; and Shafley, William K., 4,408,405., Cl. 37-62.000.

Sharovatov, Viktor I.: *See*—
Leonov, Ivan A.; Smirnov, Boris V.; Mashinin, Vladimir V.; and Sharovatov, Viktor I., 4,408,726., Cl. 242-7.090.

Sharp Kabushiki Kaisha: *See*—
Iwai, Hiroji; and Matsui, Hirotoshi, 4,408,917., Cl. 400-637.200.
Kikuno, Masayuki, 4,408,836., Cl. 350-334.000.
Kozaki, Syuichi; Funada, Fumiaki; and Minezaki, Shigehiro, 4,408,837., Cl. 350-336.000.
Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.

Shauger, Herbert A., to Fischer & Porter Company. Electronic totalizer. 4,409,660., Cl. 364-510.000.

Shearhart, Billy G., to Sooner Oil Tools, Inc. Retrievable packer for oil well casing. 4,408,662., Cl. 166-124.000.

Sheem, Sang K., to United States of America, Navy. Optical gyroscope with time dependent wavelength. 4,408,882., Cl. 356-350.000.

Shefer, Joshua; and Catanese, Carmen A., to RCA Corporation. Electron gun with improved beam forming region. 4,409,514., Cl. 313-449.000.

Shekter, Robert J. Ski and a ski binding. 4,408,779., Cl. 280-607.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Wood, Derek A., 4,409,150., Cl. 260-465.00D.

Shell Oil Company: *See*—
Blytas, George C., 4,409,199., Cl. 423-573.00G.
Dominguez, Manuel F.; and Ferguson, Joseph E., 4,408,570., Cl. 122-510.000.
Martin, Michael K., 4,409,120., Cl. 525-280.000.
Paxson, Timm E., 4,409,397., Cl. 562-496.000.
Roman, Steven A., 4,409,398., Cl. 562-506.000.

Shelton, William S., to ACF Industries, Incorporated. High pressure sealing connection with metal seal. 4,408,771., Cl. 277-206.00R.

Shend'ge, Vasant J.; and Thompson, Geoffrey S., to Multicore Solders Limited. Portable wire dispenser. 4,408,730., Cl. 242-96.000.

Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, to Symbol Technologies, Inc. Narrow-bodied, single-and twin-windowed portable laser scanning head for reading bar code symbols. 4,409,470., Cl. 235-472.000.

Sheth, Harshad V.: *See*—
Cordea, James N.; and Sheth, Harshad V., 4,409,027., Cl. 75-128.00W.

Shibukawa, Mitsuru: *See*—
Hayashi, Hiroshi; Kiyota, Takao; and Shibukawa, Mitsuru, 4,409,105., Cl. 210-679.000.

Shida, Mitsuzo: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,409,364., Cl. 525-74.000.

Shikishima Tipton Mfg. Co., Ltd.: *See*—
Kobayashi, Hisamine; and Miyashiro, Mutsumi, 4,408,417., Cl. 51-163.200.

Shimadzu Corporation: *See*—
Nakamura, Kenji; and Ideno, Shigeru, 4,409,597., Cl. 346-35.000.

Shimbashi, Ichiro: *See*—
Yokoyama, Hideo; Shimbashi, Ichiro; Sakurai, Koichi; and Matsuo, Munetsugu, 4,408,561., Cl. 118-72.000.

Shimek, Daniel C.: *See*—
Shimek, Ronald J.; and Shimek, Daniel C., 4,408,594., Cl. 126-121.000.

Shimek, Ronald J.; and Shimek, Daniel C. Fireplace heated grate. 4,408,594., Cl. 126-121.000.

Shimizu, Akira: *See*—
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.

Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, to Canon Kabuskiki Kaisha. Photoconductive member with two amorphous silicon layers. 4,409,308., Cl. 430-60.000.

Shimizu, Taketo: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,408,752., Cl. 269-8.000.

Shimoda, Nobuyoshi; and Hagino, Michiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Shock-absorbing bumper for vehicles. 4,408,790., Cl. 293-122.000.

Shimodaira, Tadayoshi, to Epson Corporation. Ink ribbon winding and reversing assembly. 4,408,911., Cl. 400-208.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Ichinohe, Shoji; and Kasahara, Katsusuke, 4,409,267., Cl. 427-387.000.

Shin-Etsu Polymer Co., Ltd.: *See*—
Takashi, Nogami; and Haruhiko, Masuda, 4,408,814., Cl. 339-59.00M.

Shin Meiwa Industry Co., Ltd.: *See*—
Noguchi, Fumio, 4,409,650., Cl. 364-193.000.

Shinagawa, Susumu: *See*—
Asai, Mitsuko; Shinagawa, Susumu; and Imada, Akira, 4,409,147., Cl. 260-245.20T.

Shindo, Minoru: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Shiomura, Tetsunosuke: *See*—
Asanuma, Tadashi; Uchikawa, Nobutaka; and Shiomura, Tetsunosuke, 4,409,378., Cl. 526-125.000.

Shiozawa, Takao: *See*—
Fujii, Yozo; and Shiozawa, Takao, 4,408,867., Cl. 355-8.000.

Shipley, Randall S.; and Birkelbach, Donald F., to Dow Chemical Company, The. Ultra high efficiency catalyst for polymerizing olefins. 4,409,126., Cl. 502-169.000.

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Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,409,308., Cl. 430-60.000.

Shiraishi, Hiroshi, to Hitachi, Ltd. Radiation sensitive coating composition. 4,409,317., Cl. 430-270.000.

Shiraki, Yasuyuki: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Shively, Charles D., to Cooper Laboratories, Inc. Ophthalmic solution. 4,409,205., Cl. 424-78.000.

Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Ishigaki, Tsuneo, 4,409,580., Cl. 335-243.000.

Showa Aluminum Corporation: *See*—
Hashimoto, Michitaka; and Fukui, Koichiro, 4,408,655., Cl. 165-104.270.

Shuey, John R.: *See*—
Eaby, Daniel G.; Long, William B.; and Shuey, John R., 4,408,820., Cl. 339-156.00R.

Shulman, Carl, to MSI Electronics Inc. Mercury probe and method. 4,409,546., Cl. 324-158.00P.

Sibley, Howard W.: *See*—
Bzdula, Joseph A.; and Sibley, Howard W., 4,409,362., Cl. 525-54.500.

Siby, Sture: *See*—
Dahle, Orvar; Hoffman, Bertil; Nordvall, Jan; Siby, Sture; and Widehn, Ake, 4,408,496., Cl. 73-728.000.

Sickles, Ralph A. Slide machine loading apparatus. 4,408,849., Cl. 353-103.000.

Sidey, Roger, to United States of America, Air Force. Pore pressure probe assembly and two-stage emplacement thereof. 4,408,481., Cl. 73-73.000.

Sidey, Roger: *See*—
Basford, Robert; Hart, David; Hawkins, David; Knight, David; and Sidey, Roger, 4,409,529., Cl. 318-653.000.

Siemens AG: *See*—
Neumann, Leopold; and Kline, Richard B., II, 4,409,652., Cl. 364-200.000.
Neumann, Leopold; and Kline, Richard B., II, 4,409,669., Cl. 364-900.000.

Siemens Aktiengesellschaft: *See*—
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,409,542., Cl. 324-57.00Q.
Bolmgren, Jan; Hoek, Bertil; and Nilsson, Kenth, 4,409,602., Cl. 346-140.00R.
Boscher, Georg; and Haeder, Wolfgang, 4,409,430., Cl. 174-92.000.
Friemert, Horst, 4,408,624., Cl. 134-133.000.
Kolbesen, Bernd, 4,409,075., Cl. 204-129.300.
Nilsson, Kenth; and Bolmgren, Jan, 4,409,601., Cl. 346-140.00R.
Pooch, Gerhard; and von der Neyen, Hans-Juergen, 4,409,684., Cl. 375-116.000.
Ries, Gunter, 4,409,425., Cl. 174-15.00S.

Siemens-Allis, Inc.: *See*—
Di Marco, Bernard; and Kralik, Andrew J., 4,409,573., Cl. 335-16.000.

Siemon Company, The: *See*—
Pohl, Karl-Heinz, 4,408,391., Cl. 29-861.000.

Sierra Survival Company, Inc.: *See*—
Axton, Hoyt W.; and Bailey, Corey B., 4,409,644., Cl. 362-200.000.

Sievers, Kirk A.: *See*—
Nordbrock, Raymond E.; and Sievers, Kirk A., 4,409,539., Cl. 322-28.000.
Sigel, Bernard; Semrow, Carolyn M.; Kolstedt, Mark W.; Arkans, Edward J.; and Kaczmarek, Lynn M., to Kendall Company, The. Sterile cover for instrument. 4,408,692., Cl. 206-438.000.
Sigwald, Jacques; and Lesueur, Claude, to Automobiles Peugeot; and Automobiles Citroen. Rotating joint for an exhaust pipe of an automobile vehicle. 4,408,451., Cl. 60-322.000.
Silberzahn, Helmut. Container sterilization. 4,409,188., Cl. 422-303.000.
Silver, Richard S., to Gulf Research & Development Company. Saccharification method. 4,409,329., Cl. 435-105.000.
Simkovitz, Mark D., to Wayne State University. Variable size character generator. 4,409,591., Cl. 340-731.000.
Simons, Charles R. Gameboard and carrying case. 4,408,763., Cl. 273-286.000.
Sindelar, William E.: *See*—
Schelli, William; and Sindelar, William E., 4,408,521., Cl. 100-229.00R.
Singer Company, The: *See*—
Mihovch, John; and Blackwood, John, 4,408,553., Cl. 112-158.00A.
Voza, Alfonse N., 4,408,640., Cl. 141-1.000.
Singer, Herbert B., to Charles Stark Draper Laboratory, Inc., The. Compression molding of porous retainers. 4,408,807., Cl. 308-187.000.
Singh, Prithipal: *See*—
Leung, Danton K.; and Singh, Prithipal, 4,409,325., Cl. 435-7.000.
Sinter Limited: *See*—
Caratsch, Hans-Peter, 4,408,560., Cl. 118-69.000.
Sitzler, Hans-Dietrich: *See*—
Wons, Hubert; and Sitzler, Hans-Dietrich, 4,408,520., Cl. 100-93.00P.
Skalsky, Michael: *See*—
Hirshorn, Michael S.; Skalsky, Michael; van Berkum, Petrus A.; Holley, Loraine K.; and Money, David K., 4,408,604., Cl. 128-785.000.
Skarnells, David B. Fishing lure retriever. 4,408,411., Cl. 43-17.200.
Skarvada, Thomas, to Crane Co. Digital wheel speed sensor. 4,409,664., Cl. 364-565.000.
SKF Industries, Inc.: *See*—
Walter, Lothar; Ernst, Horst M.; Brandenstein, Manfred; Kiener, Heinz; and Friedrich, Wolfgang, 4,408,809., Cl. 308-187.100.
Skinner, Geoffrey F.; and Kowal, Wieslaw M., to Foster Wheeler Energy Corporation. Synthesis gas for ammonia production. 4,409,196., Cl. 423-359.000.
Skinner, Mark C.: *See*—
Zeller-Pendrey, Jeanine I.; Skinner, Mark C.; and Morgan, David A., 4,409,316., Cl. 430-263.000.
Skobel, Max. Releasable connector. 4,408,375., Cl. 24-230.00R.
Slama, Heinrich: *See*—
Scheid, Peter; and Slama, Heinrich, 4,409,482., Cl. 250-282.000.
Sloan, Francis J. Combination flashlight and auxiliary power pack. 4,409,645., Cl. 362-200.000.
Slough, Carlton M., to Texaco Inc. System for monitoring a cathodically protected structure. 4,409,080., Cl. 204-196.000.
Slough, Carlton M.; and Colling, Edwin L., Jr., to Texaco Inc. Paraffin monitor. 4,409,553., Cl. 324-445.000.
Sloupensky, Jiri; and Tyl, Miloslay, to Vyzkumny ustav havlnarskyu. Method of and system for controlling the operation of open-end spinning machines. 4,408,447., Cl. 57-263.000.
Smalley, Ned J.: *See*—
Fillmore, William E.; Mumford, George V.; and Smalley, Ned J., 4,408,700., Cl. 222-153.000.
Smedley, Dennis; and Spare, Noel C., to Promagco Limited. Hot chamber die-casting. 4,408,651., Cl. 164-316.000.
Smirnov, Boris V.: *See*—
Leonov, Ivan A.; Smirnov, Boris V.; Mashinin, Vladimir V.; and Sharovatov, Viktor I., 4,408,726., Cl. 242-7.090.
Smith, Donald P. Combined microwave and impingement heating apparatus. 4,409,453., Cl. 219-10.55A.
Smith, Edward F., III; and Gyurina, F. Dennis, to Olin Corporation. Electrical connector material. 4,409,295., Cl. 428-591.000.
Smith, Gregory J., to Motorola, Inc. Reset circuit for data latches. 4,409,494., Cl. 307-238.300.
Smith, Harry D., Jr.; Schultz, Ward E.; and Verbout, Jerry L., to Halliburton Company. Method for simultaneous measurement of thermal neutron decay components. 4,409,481., Cl. 250-270.000.
Smith International Inc.: *See*—
Gruller, David L., 4,408,783., Cl. 285-3.000.
Smith, James V., Jr.: *See*—
Aloisio, Charles J., Jr.; Lenahan, Terrence A.; Smith, James V., Jr.; and Taylor, Carl R., 4,409,263., Cl. 427-163.000.
Smith, Jimmy B., to Peabody Coal Company. Quenching method and apparatus. 4,409,067., Cl. 201-1.000.
Smith, Kenneth E.: *See*—
Hatcher, Charles S.; and Smith, Kenneth E., 4,408,376., Cl. 28-245.000.
Smith, Michael H., to SCM Corporation. Reverse tab control system for typewriters. 4,408,915., Cl. 400-290.000.
Smith, Michael H., to SCM Corporation. Halfspace control system for electronic typewriter with correction register. 4,408,918., Cl. 400-697.100.
Smith, Robert E.; and Bissell, Eugene R. Substrates and method for determining enzymes. 4,409,140., Cl. 260-112.50R.
Smith, Roger D.: *See*—
Belcher, Samuel L.; Peck, Timothy R.; and Smith, Roger D., 4,409,455., Cl. 219-10.810.
Sneed, Joe W., Jr.: *See*—
Rochon, Robert W.; and Sneed, Joe W., Jr., 4,408,486., Cl. 73-155.000.
Snell, George J.; and Huibers, Derk T. A. Lignin cracking process using fast fluidized bed reactions. 4,409,416., Cl. 585-635.000.
Societe Anonyme de Telecommunications: *See*—
Koreicho, Wladimir, 4,408,734., Cl. 244-3.130.
Societe Anonyme dite: Alsthom-Atlantique: *See*—
Combes, Gilles; and Kuntz, Raymond, 4,408,892., Cl. 366-337.000.
Societe Anonyme dite Ateliers et Chantiers de Bretagne-ACB: *See*—
Ninet, Jean-Louis; and Vaillant, Robert, 4,408,930., Cl. 405-209.000.
Societe Anonyme dite: Ceraver: *See*—
Willem, Michel; and Gamet, Lucien, 4,409,432., Cl. 174-172.000.
Willem, Michel, 4,409,433., Cl. 174-172.000.
Societe Anonyme dite Compagnie General d'Electricite: *See*—
Parant, Jean-Paul, 4,409,292., Cl. 428-428.000.
Societe Anonyme dite Compagnie Lyonnaise de Transmissions Optiques: *See*—
Grenat, Bernard, 4,409,154., Cl. 264-1.500.
Societe Chimique des Charbonnages-CDF Chimie: *See*—
Decroix, Jean-Claude, 4,409,286., Cl. 428-332.000.
Societe IMAJE: *See*—
Lepesant, Jean P.; and Tantot, Georges, 4,409,039., Cl. 106-20.000.
Societe Nationale Elf Aquitaine Tour Aquitane: *See*—
Gueneau, Michel, 4,408,715., Cl. 237-2.00B.
Societe Nationale Industrielle Aerospatiale: *See*—
Ricaud, Pierre, 4,409,667., Cl. 364-732.000.
Societe Suisse pour l'Industrie Horlogere Management Services, S.A.: *See*—
Gagnebin, Gaston, 4,408,901., Cl. 368-321.000.
Vuilleumier, Cyril; and Erni, Bruno, 4,408,898., Cl. 368-220.000.
Soderstrom, Sven-Erik: *See*—
Lofgren, Folke; and Soderstrom, Sven-Erik, 4,409,476., Cl. 250-227.000.
Solar 77 S.p.A.: *See*—
Caputo, Carmelo, 4,409,490., Cl. 290-4.00D.
Solymes, Laszlo, to Malom-Es Sutoipari Kutatointezet. Dust disposal cyclones. 4,409,008., Cl. 55-261.000.
Soma, Hiromi: *See*—
Tabayashi, Isao; Soma, Hiromi; and Fukutomi, Hiroshi, 4,409,040., Cl. 106-20.000.
Sommeria, Marcel R. Transistor motor control. 4,409,527., Cl. 318-341.000.
Sondergeld, Manfred A. J., to Du Pont de Nemours, E. I., and Company. Etching solution for etching of photopolymeric films. 4,409,115., Cl. 252-79.100.
Sonobond Ultrasonics, Inc.: *See*—
Devine, Janet, 4,409,659., Cl. 364-475.000.
Sony Corporation: *See*—
Kimura, Teiji; and Kimura, Shigeru, 4,408,372., Cl. 24-217.00R.
Saito, Etsuro, 4,409,630., Cl. 360-99.000.
Yamauchi, Hiroyuki; and Yamagami, Tamotsu, 4,409,526., Cl. 318-254.000.
Yasumura, Masayuki, 4,409,523., Cl. 315-371.000.
Sools, Franciscus G. P.: *See*—
Van Der Sande, Johannes H. M.; Sools, Franciscus G. P.; and Campbell, Ronald J., 4,409,517., Cl. 313-631.000.
Sooner Oil Tools, Inc.: *See*—
Shearhart, Billy G., 4,408,662., Cl. 166-124.000.
Soraya, Sorayapour; Feld, Gundolf; and Wacker, Fredy, to Stahlwerke Rochling-Burbach GmbH. Method for thermal treatment of wire lashings and a continuous-heating furnace for performance of the method. 4,408,986., Cl. 432-6.000.
SORTIMAT Creuz & Co. GmbH: *See*—
Holzwarth, Friedrich; and Heinze, Gerhard, 4,409,046., Cl. 156-73.600.
South Wales Switchgear Limited: *See*—
Parry, John, 4,409,446., Cl. 200-147.00R.
Southwestern Pipe, Inc.: *See*—
Lewis, Philip C., 4,408,748., Cl. 256-11.000.
Southwire Company: *See*—
Baldasarri, Giuseppe, 4,408,903., Cl. 374-121.000.
Spain, Raymond G., to Hitco. Epoxy resin emulsion finishes for carbon fibers. 4,409,288., Cl. 428-367.000.
Spangle, Lloyd B., to Dow Chemical Company, The. Apparatus and method for measuring the expansion properties of a cement composition. 4,408,489., Cl. 73-432.00R.
Spare, Noel C.: *See*—
Smedley, Dennis; and Spare, Noel C., 4,408,651., Cl. 164-316.000.
Sparrow, David J. W.: *See*—
Sampson, John D.; and Sparrow, David J. W., 4,408,886., Cl. 366-13.000.
Spencer, Paul R.: *See*—
Camis, Thomas; Spencer, Paul R.; Schwiebert, Erwin H.; and Hay, Robert R., 4,408,865., Cl. 355-3.0CH.
Sperry Corporation: *See*—
Butler, L. Dennis; and Wells, J. Dwayne, 4,408,942., Cl. 414-24.500.
Tanski, William J., 4,409,570., Cl. 333-187.000.
Wesner, Charles R., 4,409,639., Cl. 361-167.000.
Spivak, Bruce D., to PQ Corporation. Spray drying method of preparing hollow fibers. 4,409,158., Cl. 264-8.000.
Sportoletti, Giancarlo: *See*—
Cremonesi, Pietro; and Sportoletti, Giancarlo, 4,409,103., Cl. 210-638.000.
Sprague Electric Company: *See*—
Edson, Douglas M., 4,409,642., Cl. 361-433.000.

Markarian, Paul M., 4,408,818., Cl. 339-147.00C.
Sprague, Robert A.; and Scifres, Donald R., to Xerox Corporation. Optical cursor control device. 4,409,479., Cl. 250-237.00G.
Spurrell, Roworth A. J.; Camm, Alan J.; and Ward, David E., to Telectronics Pty. Ltd. Rate related tachycardia control pacer. 4,408,606., Cl. 128-419.0PG.
Square D Company: *See—*
Profio, Mark V.; Libert, James T.; and Kampf, Julian C., 4,409,640., Cl. 361-197.000.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Oligomers of perfluoro(2,2-dimethyl-1,3-dioxole) and their fluorination products. 4,409,393., Cl. 549-448.000.
SRI International: *See—*
Weaver, Charles S.; and Chittenden, Constance T., 4,408,614., Cl. 128-680.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, to C. H. Boehringer Sohn. Substituted 7-(2,6-dibromo-4-methyl-phenyl)-2,3-dihydro-imidazo[1,2-a]imidazoles, compositions and use. 4,409,235., Cl. 424-273.00R.
Stahlhofen, Paul: *See—*
Buhr, Gerhard; Ruckert, Hans; and Stahlhofen, Paul, 4,409,314., Cl. 430-192.000.
Stahlwerke Rochling-Burbach GmbH: *See—*
Soraya, Sorayapour; Feld, Gundolf; and Wacker, Fredy, 4,408,986., Cl. 432-6.000.
Staikos, Dimitri N.: *See—*
Seidel, William C.; and Staikos, Dimitri N., 4,409,076., Cl. 204-130.000.
Stamicarbon, B.V.: *See—*
Brasz, Albert J. H.; and Wallink, Hermanus A., 4,409,164., Cl. 264-50.000.
Kleuskens, Engelina C.; Maessen, Johannes G. H.; and van de Mond, Theodorus J., 4,409,122., Cl. 50`.20.000.
Stanczak, John S.: *See—*
Mohan Rao, G. R.; Stanczak, John S.; Lien, Jih-chang; and Bhatia, Shyam, 4,408,385., Cl. 29-576.00B.
Standard Car Truck Company: *See—*
Geyer, Robert P., 4,408,810., Cl. 308-226.000.
Standard Microsystems Corporation: *See—*
Zapisek, John M.; and Giulekas, Gus, 4,409,499., Cl. 307-468.000.
Standard Oil Company (Indiana): *See—*
Oita, Jack I., 4,409,336., Cl. 436-123.000.
Stanek, Jaroslav: *See—*
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,409,209., Cl. 424-177.000.
State Industries, Inc.: *See—*
Daniels, Joseph C., 4,408,689., Cl. 206-45.170.
Staudaher, Steven M.: *See—*
Wallach, Steven; Holberger, Kenneth D.; Keating, David L.; and Staudaher, Steven M., 4,409,655., Cl. 364-200.000.
Stauffer Chemical Company: *See—*
Freiberg, Ashley H., 4,409,211., Cl. 424-203.000.
Humphrey, Lawrence F., 4,409,152., Cl. 260-543.00P.
Petersen, Alfred W., 4,409,194., Cl. 423-321.00R.
Steag Aktiengesellschaft: *See—*
Adrian, Fritz; Sattler, Heinrich; and Sauerland, Werner, 4,408,723., Cl. 241-19.000.
Steen, Harald B.: *See—*
Lindmo, Tore; and Steen, Harald B., 4,408,877., Cl. 356-38.000.
Steidle, Kurt A., to Motion Technology Corporation. Method and apparatus for microfilming documents of varied length. 4,408,876., Cl. 355-54.000.
Steilen, Ronald M., to Deere & Company. Feed cup assembly with flexible metering gate. 4,408,704., Cl. 222-312.000.
Steinhaus GmbH: *See—*
Wolff, Kurt, 4,409,099., Cl. 209-399.000.
Steinke, Mark H., to Lyon Metal Products, Incorporated. Connector having bending means. 4,408,928., Cl. 403-405.000.
Stelmack, Lawrence A., to Acton Research Corporation. Vacuum ultraviolet reflectance filter. 4,408,825., Cl. 350-1.700.
Stelson, Kim A.: *See—*
Gossard, David C.; West, John; Stelson, Kim A.; Allison, Blair; Webb, R. Davis, Jr.; and Hardt, David, 4,408,471., Cl. 72-21.000.
Stenger, Antoine: *See—*
Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, 4,409,241., Cl. 424-324.000.
Stenzel, Wolfgang; and Cohnen, Erich, to Beiersdorf Aktiengesellschaft. Substituted aryloxyamino propanols, and process for their use. 4,409,231., Cl. 424-272.000.
Stephens, James B.: *See—*
Miller, Charles G.; and Stephens, James B., 4,408,834., Cl. 350-321.000.
Steuben, Ronald G. Automatically connecting hitch. 4,408,778., Cl. 280-509.000.
Stevens, James W., to British Aerospace Public Limited Company. Method of forming articles by plating. 4,409,070., Cl. 204-4.000.
Stewart, Graham G.; Goring, Thomas E.; and Russell, Ingeborg, to Labatt Brewing Company Limited. Yeast strain for fermenting high plato value worts. 4,409,246., Cl. 426-16.000.
Stinehelfer, Jonathan J., to Fairchild Camera & Instrument Corporation. Address gate for memories to protect stored data, and to simplify memory testing, and method of use thereof. 4,409,675., Cl. 365-201.000.
Stines, William B.: *See—*
Haas, Paul A.; and Stines, William B., 4,409,157., Cl. 264-0.500.
Stock, Hugh J., to Pacer Technology and Resources, Inc. Dispensing tip for cyanoacrylate adhesives. 4,408,699., Cl. 222-149.000.
Stofko, John, to Jansky, John. Production of composite products by consolidation using pressure and convection heating. 4,409,170., Cl. 264-113.000.
Stoft, Paul E.: *See—*
Johannsmeier, Karl-Heinz; Stoft, Paul E.; and Larsen, Tor G., 4,408,885., Cl. 356-401.000.
Stolzenbach, Heinrich; Heitzmann, Rudolf; and Heinrich, Siegfried, to Herberts GmbH. Heat-curable coating composition, its use and process for coating substrates. 4,409,340., Cl. 521-159.000.
Stone, Richard G.: *See—*
Kulkarni, Satish V.; and Stone, Richard G., 4,408,500., Cl. 74-572.000.
Stora Kopparbergs Bergslags Aktiebolag: *See—*
Qvarnstrom, Bengt G. L., 4,408,549., Cl. 111-2.000.
Strasser, Rudolf: *See—*
Dempf, Dominik; Schmidhammer, Ludwig; Dummer, Gerhard; Roscher, Gunter; Schmidt, Karl-Heinz; Selbertinger, Ernst; and Strasser, Rudolf, 4,409,396., Cl. 560-245.000.
Strehl, Jean-Marc: *See—*
Duruz, Louis; and Strehl, Jean-Marc, 4,409,463., Cl. 219-121.0LG.
Streich, Robert E.: *See—*
Dornberger, Georg C. E.; and Streich, Robert E., 4,409,042., Cl. 148-129.000.
Stricker, Herbert, to Boehringer Ingelheim GmbH. Transdermal release system for pharmaceutical preparation. 4,409,206., Cl. 424-81.000.
Strom, Jan T., to Gusums Bruk AB. Forming fabric. 4,408,638., Cl. 139-425.00A.
Stuckas, Kenneth J., to Teledyne Industries, Inc. Fuel control system. 4,408,585., Cl. 123-440.000.
Stuemky, Robert E., to Gates Rubber Company, The. Ferrule, coupling and coupling process. 4,408,786., Cl. 285-256.000.
Stumpf, Harry C.: *See—*
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,409,036., Cl. 148-2.000.
Stuntz, Gordon: *See—*
Bearden, Roby, Jr.; and Stuntz, Gordon, 4,409,093., Cl. 208-108.000.
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn. Integrated latching actuators. 4,409,638., Cl. 361-152.000.
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; Fujimoto, Tsuneo; and Kubota, Minoru, to Mitsubishi Gas Chemical Company, Inc. Process for producing sodium percarbonate. 4,409,197., Cl. 423-415.00P.
Sugawara, Koko: *See—*
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,409,210., Cl. 424-177.000.
Sugihara, Noriyuki, to Hewlett-Packard Company. Impedance meter. 4,409,543., Cl. 324-57.00R.
Sugino, Morihiko; and Saura, Eiji, to Kabushiki Kaisha Kobe Seiko Sho. Porous moldings made of accumulated mass of stringy or thready extrudates. 4,409,284., Cl. 428-304.400.
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, to Kubota Ltd. Heat resistant cast iron-nickel-chromium alloy. 4,409,025., Cl. 420-584.000.
Sugiura, Yoshinori, to Canon Kabushiki Kaisha. Image fixing device. 4,408,559., Cl. 118-60.000.
Suhler, Sidney A.: *See—*
Owen, Thomas E.; Suhler, Sidney A.; and Peters, Wendell R., 4,408,533., Cl. 102-211.000.
Sullivan, David P.: *See—*
Lelental, Mark; Rasch, Arthur A.; and Sullivan, David P., 4,409,307., Cl. 430-31.000.
Sullivan, Patrick F. Cab-mounted fairing. 4,408,792., Cl. 296-1.00S.
Sumikawa, Kenji: *See—*
Araki, Ikuo; Kanazawa, Teruo; Ito, Shinji; and Sumikawa, Kenji, 4,408,534., Cl. 102-288.000.
Sumitomo Chemical Co., Ltd.: *See—*
Sakiyama, Kazuo; Kuwata, Mitsuo; and Oshiumi, Masaru, 4,409,077., Cl. 204-159.150.
Sumitomo Durez Company, Ltd.: *See—*
Kikuga, Toyoji; and Hirai, Koji, 4,409,374., Cl. 525-491.000.
Sumitomo Heavy Industries, Ltd.: *See—*
Kurozu, Shinichi, 4,409,022., Cl. 75-36.000.
Sun Chemical Corporation: *See—*
Mattis, Donald J., 4,408,817., Cl. 339-147.00R.
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., to Texaco Inc. Gasoline compositions containing amino alkanoic acids as detergents. 4,409,001., Cl. 44-71.000.
Sunx Limited: *See—*
Furuta, Naofumi; and Ohi, Kunio, 4,409,473., Cl. 250-206.000.
Superior Graphite Co.: *See—*
Goldberger, William M., 4,409,073., Cl. 204-67.000.
Survival Technology, Inc.: *See—*
Sarnoff, Stanley J., 4,408,610., Cl. 128-642.000.
Sutoh, Shinji; Hara, Toshizo; Harada, Takeshi; and Eda, Masahiro, to Diesel Kiki Company, Ltd. Vehicle humidity control apparatus for preventing fogging of windows. 4,408,660., Cl. 165-21.000.
Sutter, Gerald, to Teichgraeber, Richard K. Telescoping cylinder stabilizer. 4,408,424., Cl. 52-115.000.
Sutton, Leonard, to Baker Perkins Holdings Limited. Wrapping machines. 4,408,435., Cl. 53-225.000.
Suwabe, Isaku; and Mori, Motoaki, to Nichiro Kogyo Company, Ltd. Band type strapping machine. 4,409,058., Cl. 156-361.000.

Suzue, Seisuke: *See*—
Namba, Mutsusuke; Suzue, Seisuke; Mizuno, Toshio; and Kataoka, Yoshiaki, 4,409,354., Cl. 524-431.000.
Suzuki, Akira; Yoshikawa, Yukio; and Kaneko, Katumi, to Copal Company Limited. Device for locking a blade driver in an electronic shutter. 4,408,856., Cl. 354-234.000.
Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having portaments property. 4,408,514., Cl. 84-1.240.
Suzuki, Hitoshi: *See*—
Miyazaki, Kunio; Okosi, Yukio; Kumagai, Akira; and Suzuki, Hitoshi, 4,409,079., Cl. 204-192.00C.
Suzuki, Kazuie, to Hokushin Electric Works, Ltd. Electromagnetic flowmeter for measuring ferromagnetic slurries. 4,408,497., Cl. 73-861.170.
Suzuki, Masayuki: *See*—
Nishino, Hiroshi; Suzuki, Masayuki; and Hirota, Hideo, 4,409,125., Cl. 502-180.000.
Suzuki, Osamu: *See*—
Ooishi, Kengo; and Suzuki, Osamu, 4,408,733., Cl. 242-199.000.
Suzuki, Shigeru: *See*—
Nakayama, Shozo; Suzuki, Shigeru; and Hattori, Mitsuhiro, 4,408,962., Cl. 417-269.000.
Svantesson & Andersson Mekaniska (SAMEK) AB: *See*—
Svantesson, Gustav I., 4,408,644., Cl. 150-55.000.
Svantesson, Gustav I., to Svantesson & Andersson Mekaniska (SAMEK) AB. Drinking cup. 4,408,644., Cl. 150-55.000.
Swales, Doris, heir: *See*—
Swales, Frank, deceased; and Swales, Doris, heir, 4,408,536., Cl. 102-379.000.
Swales, Frank, deceased; and Swales, Doris, heir, to United States of America, Navy. Method of re-entry body separation and ejection. 4,408,536., Cl. 102-379.000.
Swan, Richard L. Cold-weather sports glove. 4,408,358., Cl. 2-161.00A.
Swartz, Jerome: *See*—
Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 4,409,470., Cl. 235-472.000.
Sweeney, William M.: *See*—
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., 4,409,001., Cl. 44-71.000.
Swerdlow, Martin S., to Imperial Chemical Industries PLC. Surface-modifying coating compositions. 4,409,285., Cl. 428-332.000.
Swiers, Richard H.; and Parkison, Richard G., to American Standard, Inc. Swivel valve. 4,408,745., Cl. 251-357.000.
Swift, Harold E.; Innes, Robert A.; and Onopchenko, Anatoli, to Millmaster Onyx Group, Inc. Process for producing aliphatic amines. 4,409,399., Cl. 564-473.000.
Swigert, J. Kirk; and Pochan, Darlyn F., to Xerox Corporation. Magnetic imaging. 4,409,598., Cl. 346-74.200.
Sylvester, Paul J.: *See*—
Murray, Joseph E., Jr.; and Sylvester, Paul J., 4,409,441., Cl. 179-111.00R.
Symbol Technologies, Inc.: *See*—
Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 4,409,470., Cl. 235-472.000.
Syntex (U.S.A.) Inc.: *See*—
Yu, Cheng-Der, 4,409,239., Cl. 424-305.000.
Syva Company: *See*—
Leung, Danton K.; and Singh, Prithipal, 4,409,325., Cl. 435-7.000.
Szczurek, Marian: *See*—
Uhlig, Klaus; Szczurek, Marian; Vilacha, Carlos; and Beckmann, Juergen, 4,408,631., Cl. 137-380.000.
Szewczyk, Richard S., to USM Corporation. Machine tool indexing mechanism. 4,408,507., Cl. 82-36.00A.
Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Charge control circuit. 4,409,538., Cl. 320-11.000.
Tabata, Shunsaku: *See*—
Furuta, Tadaaki; and Tabata, Shunsaku, 4,409,106., Cl. 210-732.000.
Tabayashi, Isao; Soma, Hiromi; and Fukutomi, Hiroshi, to Dainippon Ink and Chemicals Inc. Ink for use in ink-jet printer. 4,409,040., Cl. 106-20.000.
Tachikawa Spring Co., Ltd.: *See*—
Mizushima, Yoichi; Hosonaga, Taketoshi; Murakami, Takashi; and Ujiie, Nikio, 4,408,798., Cl. 297-326.000.
Tagami, Mutsukazu: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,408,752., Cl. 269-8.000.
Takada, Haruhiko, to Diesel Kiki Co., Ltd. Vane compressor having improved rotor supporting means. 4,408,969., Cl. 418-93.000.
Takahashi, Fumitaka; and Gotoh, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Angular velocity sensor. 4,408,490., Cl. 73-497.000.
Takahashi, Harumi: *See*—
Ogata, Yoshihiro; Sakamoto, Koji; Takahashi, Harumi; and Hirakura, Koji, 4,408,863., Cl. 355-3.0TR.
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, to Bridgeport Tire Co. Ltd.; and Institute of Technology Precision Electrical Discharge Works. System for manufacturing tire molding metal molds with electrical discharge machining. 4,409,457., Cl. 219-69.00M.
Takahashi, Makoto: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,409,025., Cl. 420-584.000.
Takahashi, Masamitsu, to Bankoku Needle Manufacturing Co., Ltd. Needle holder. 4,408,691., Cl. 206-382.000.
Takahashi, Noriyoshi: *See*—
Ito, Motoya; Fujimoto, Noboru; Takahashi, Noriyoshi; Watanabe, Masatoshi; and Yamashita, Seizi, 4,409,506., Cl. 310-166.000.
Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, 4,409,508., Cl. 310-239.000.
Takahashi, Seiichi: *See*—
Iijima, Tetsuya; and Takahashi, Seiichi, 4,408,713., Cl. 236-49.000.
Takahashi, Yukio, to Fujitsu Limited. Semiconductor memory. 4,409,674., Cl. 365-190.000.
Takai, Hideo, to Hitachi, Ltd. Bogie truck car body support system. 4,408,541., Cl. 105-199.00R.
Takamatsu, Hideo; and Minatono, Shobu, to Kuraray Co., Ltd. Curable sealing composition. 4,409,056., Cl. 156-334.000.
Takano, Ikuo; Umino, Hiroshi; and Fujiwara, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Operating mechanism for use in a circuit breaker. 4,409,449., Cl. 200-153.0SC.
Takano, Toshimasa; Hosoya, Masahiro; and Murakami, Reiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing apparatus for electrostatic copying machine. 4,408,862., Cl. 355-3.0DD.
Takao, Seiji, to Japan Exlan Company Limited. Process for producing acrylonitrile separation membranes in fibrous form. 4,409,162., Cl. 264-41.000.
Takara Shuzo Co., Ltd.: *See*—
Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.
Takashi, Nogami; and Haruhiko, Masuda, to Shin-Etsu Polymer Co., Ltd. Electric connector of press-contact holding type. 4,408,814., Cl. 339-59.00M.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,214., Cl. 424-246.000.
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Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,409,217., Cl. 424-246.000.
Takasugi, Tsuneji; and Umezawa, Seiji, to Citizen Watch Company Limited. Joint structure of bezel and watch body. 4,408,900., Cl. 368-295.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical, Co., Ltd. 7-Acylamino-3-vinylcephalosporanic acid derivatives and processes for the preparation thereof. 4,409,214., Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-Acylamino-3-substituted cephalosporanic acid derivatives and processes for the preparation thereof. 4,409,215., Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,409,217., Cl. 424-246.000.
Takayashiki, Tetsuya; Usui, Taiji; and Sakurai, Tetsuma, to Oki Electric Industry Co., Ltd.; and Nippon Telegraph and Telephone Public Corporation. Method of manufacturing semiconductor integrated circuit devices. 4,408,386., Cl. 29-576.00E.
Takeda Chemical Industries, Ltd.: *See*—
Asai, Mitsuko; Shinagawa, Susumu; and Imada, Akira, 4,409,147., Cl. 260-245.20T.
Ishida, Yasuo, 4,409,018., Cl. 71-96.000.
Nishino, Hiroshi; Suzuki, Masayuki; and Hirota, Hideo, 4,409,125., Cl. 502-180.000.
Takei, Akihiko: *See*—
Minegishi, Keiichi; Akiba, Tokuji; Harada, Hiroshi; Takei, Akihiko; and Abe, Motoshi, 4,409,030., Cl. 106-97.000.
Takemae, Yoshihiro, to Fujitsu Limited. Dynamic semiconductor memory device. 4,409,672., Cl. 365-149.000.
Takemae, Yoshihiro; and Nakano, Masao, to Fujitsu Limited. Semiconductor integrated circuit device. 4,409,677., Cl. 365-206.000.
Takemae, Yoshihiro; and Baba, Fumio, to Fujitsu Limited. Semiconductor memory device. 4,409,678., Cl. 365-206.000.
Takemoto, Kazuaki: *See*—
Naganoma, Masanori; Takemoto, Kazuaki; and Moriya, Mitsutoshi, 4,408,712., Cl. 236-13.000.
Takemura, Yasuhiko; and Akutsu, Fumihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic scanning apparatus. 4,408,491., Cl. 73-626.000.
Takeuchi, Akihiro: *See*—
Asai, Kiyokazu; Oshima, Yujiro; Takeuchi, Akihiro; and Tokoro, Hiroharu, 4,408,479., Cl. 73-35.000.
Takeuchi, Seizi; and Matsuda, Shimpei, to Hitachi, Ltd. Method of manufacturing catalyst. 4,409,129., Cl. 502-185.000.
Takeuchi, Yasuhiro: *See*—
Kosuda, Toru; Takeuchi, Yasuhiro; Matsubara, Noboru; and Takizawa, Masaaki, 4,408,580., Cl. 123-90.160.
Takiguchi, Michitaka; and Horie, Fujio, to Brother Kogyo Kabushiki Kaisha. Automatic needle thread control apparatus. 4,408,554., Cl. 112-302.000.
Takikawa, Yoshio: *See*—
Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, 4,409,508., Cl. 310-239.000.
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of dihydroxybenzoic acid and pharmaceutical composition thereof. 4,409,240., Cl. 424-319.000.

Takizawa, Masaaki: *See*—
Kosuda, Toru; Takeuchi, Yasuhiro; Matsubara, Noboru; and Takizawa, Masaaki, 4,408,580., Cl. 123-90.160.

Takoh, Isao: *See*—
Oouchi, Keiji; Takoh, Isao; and Serizawa, Hisayuki, 4,409,452., Cl. 219-10.55E.

Takubo, Takayuki; and Okano, Takeshi, to Victor Company of Japan, Limited. Television camera with an electronic view finder. 4,409,619., Cl. 358-224.000.

Tamai, Yasuo: *See*—
Mizuno, Chiaki; Tamai, Yasuo; and Kasuga, Akira, 4,409,299., Cl. 428-694.000.
Ogawa, Hiroshi; Kasuga, Akira; Tamai, Yasuo; and Yamada, Yasuyuki, 4,409,291., Cl. 428-425.900.

Tamasovics, John F.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,408,695., Cl. 220-3.300.

Tanabe, Osamu: *See*—
Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.

Tanaka, Sadao: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Tanaka, Steve K.: *See*—
Hanamoto, Mark S.; and Tanaka, Steve K., 4,409,335., Cl. 436-67.000.

Tanaka, Toshiaki, to Sailor Pen Co., Ltd., The. Injection molding machine. 4,408,973., Cl. 425-139.000.

Tanaka, Toshihide: *See*—
Setsune, Kentaro; and Tanaka, Toshihide, 4,409,567., Cl. 333-151.000.

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Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.

Tanimoto, Kazuo: *See*—
Kurafuji, Setsuo; and Tanimoto, Kazuo, 4,409,679., Cl. 365-227.000.

Tanimura, Yusaburo; and Kumasaka, Hideo, to Toyo Seikan Kaisha, Ltd. Sealing compound for can ends. 4,409,359., Cl. 524-575.000.

Taniuchi, Masahiko: *See*—
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.

Tanner, Milton R., to Central Plants, Inc. Process for removing contaminants from a stream of methane gas. 4,409,102., Cl. 210-603.000.

Tano, Mikio, to Dai Nippon Insatsu Kabushiki Kaisha. Carton's depressed line height measuring device. 4,408,487., Cl. 13-159.000.

Tanski, William J., to Sperry Corporation. Separated substrate acoustic wave device. 4,409,570., Cl. 333-187.000.

Tantot, Georges: *See*—
Lepesant, Jean P.; and Tantot, Georges, 4,409,039., Cl. 106-20.000.

Tarcsay, Lajos: *See*—
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,409,209., Cl. 424-177.000.

Taverna, Andrea, to Gabbrielli Impianti di Gabbrielli Franco & C.s.a.s. Apparatus for transferring articles from one conveying line to another conveying line whose directions are angularly spaced. 4,408,686., Cl. 198-433.000.

Taylor, Carl R.: *See*—
Aloisio, Charles J., Jr.; Lenahan, Terrence A.; Smith, James V., Jr.; and Taylor, Carl R., 4,409,263., Cl. 427-163.000.

Taylor, Kenneth E., to United Technologies Corporation. Induction furnace having improved thermal profile. 4,409,451., Cl. 219-10.49R.

Taylor, Peter M.: *See*—
Darwood, Phillip I.; Holland, Ernest; Taylor, Peter M.; and Marley, Christopher, 4,408,399., Cl. 33-203.180.

Taylor, Randle W.; and Davey, Richard G., to Owens-Illinois, Inc. Constant oil to water ratio shear spray system. 4,409,014., Cl. 65-170.000.

TDK Electronics Co., Ltd.: *See*—
Ohkawa, Takehisa; and Yoda, Kuniichi, 4,409,300., Cl. 428-695.000.

Technical Rubber Company, Inc.: *See*—
Litterini, Donald E., 4,408,649., Cl. 152-367.000.

Technicare Corporation: *See*—
Pinkstaff, Carlos D., 4,409,484., Cl. 250-363.00S.

Technopulp A.G.: *See*—
Kasser, Alexander, 4,409,065., Cl. 162-9.000.

Tedeschi, Anthony: *See*—
Chapman, James S.; and Tedeschi, Anthony, 4,408,753., Cl. 269-8.000.

Tegman, Ragnar: *See*—
Larker, Hans; and Tegman, Ragnar, 4,409,029., Cl. 419-10.000.

Teichgraeber, Richard K.: *See*—
Sutter, Gerald, 4,408,424., Cl. 52-115.000.

Teikoku Chuck Co., Ltd.: *See*—
Yamane, Yasuhide, 4,408,522., Cl. 100-295.000.

Telectronics Pty. Ltd.: *See*—
Daly, Christopher N.; and Money, David K., 4,408,608., Cl. 128-421.000.
Spurrell, Roworth A. J.; Camm, Alan J.; and Ward, David E., 4,408,606., Cl. 128-419.0PG.

Teledyne Industries Inc.: *See*—
Leblanc, Raymond F.; and Cummins, William T., 4,408,931., Cl. 405-213.000.
Stuckas, Kenneth J., 4,408,585., Cl. 123-440.000.

Telefonaktiebolaget L M Ericsson: *See*—
Kjoller, Hans O. S., 4,409,651., Cl. 364-200.000.

Teletronics Pty, Limited: *See*—
Hirshorn, Michael S.; Skalsky, Michael; van Berkum, Petrus A.; Holley, Loraine K.; and Money, David K., 4,408,604., Cl. 128-785.000.

Teletype Corporation: *See*—
Ciesiel, Allen R.; LaSpesa, Richard E.; and Zolavvar, Ruperto B., 4,408,914., Cl. 400-208.000.

Tell, Mayo B.: *See*—
Bryan, James S.; Gaster, Ivan; Tell, Mayo B.; and Dunn, Claude, 4,408,395., Cl. 30-179.000.

Tenney, John B., Jr., to United States of America, National Aeronautics and Space Administration. Prosthetic occlusive device for an internal passageway. 4,408,597., Cl. 128-1.00R.

Terachi, Junichi: *See*—
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,444., Cl. 200-144.00R.
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Terashima, Shigeo: *See*—
Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.

Terkanian, Harry. Power converter using a resonant circuit. 4,409,647., Cl. 363-27.000.

Terrase, Leon J. Sacrificial anode. 4,409,081., Cl. 204-197.000.

Terui, Nobuhiko; and Watanabe, Sakuji, to Nippon Kogaku K.K. Automatic focus detecting apparatus of a camera. 4,408,854., Cl. 354-25.000.

Tewmotor Corporation: *See*—
Hildebrecht, Harold V., 4,408,775., Cl. 280-95.00R.

Texaco Inc.: *See*—
Herbstman, Sheldon, 4,409,417., Cl. 585-660.000.
Lin, Jiang-Jen; and Knifton, John F., 4,409,405., Cl. 568-902.000.
Slough, Carlton M., 4,409,080., Cl. 204-196.000.
Slough, Carlton M.; and Colling, Edwin L., Jr., 4,409,553., Cl. 324-445.000.
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., 4,409,001., Cl. 44-71.000.

Texas Instruments Incorporated: *See*—
Mohan Rao, G. R.; Stanczak, John S.; Lien, Jih-chang; and Bhatia, Shyam, 4,408,385., Cl. 29-576.00B.
Tubbs, Graham S., 4,409,665., Cl. 364-707.000.

Thermacore, Inc.: *See*—
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., 4,408,661., Cl. 165-164.000.

Thermoform Bau-Und Forschungsgesellschaft: *See*—
Paszner, Laszlo; and Chang, Pei-Ching, 4,409,032., Cl. 127-37.000.

Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., to Coulter Systems Corporation. Digital plate maker system and method. 4,408,868., Cl. 355-14.00R.

Thomas, Gareth J.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,409,391., Cl. 549-39.000.

Thomas, George L.; and Graff, William A., to General Electric Company. Rounded end halogen lamp with exhaust tube having different glass. 4,409,516., Cl. 313-579.000.

Thomas, Warren E.: *See*—
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., 4,408,661., Cl. 165-164.000.

Thomin, Georges: *See*—
Le Stang, Jean-Claude; and Thomin, Georges, 4,409,493., Cl. 307-132.00R.

Thompson, Donnie. Apparatus for washing an aloe vera leaf. 4,408,364., Cl. 15-21.00D.

Thompson, Geoffrey S.: *See*—
Shend'ge, Vasant J.; and Thompson, Geoffrey S., 4,408,730., Cl. 242-96.000.

Thompson, Raymond D., to Deere & Company. Compact, planar, multi-directional vibration attenuator seat support. 4,408,744., Cl. 248-636.000.

Thomson-Brandt: *See*—
Deffayet, Jean; and Lamarque, Etienne, 4,408,538., Cl. 102-522.000.

Thomson-CSF: *See*—
Metz, Pierre, 4,408,735., Cl. 244-3.220.

Thomson-CSF Broadcast, Inc.: *See*—
McMann, Renville H., Jr.; Kreinik, Stephen; and Novack, Martin M., 4,409,615., Cl. 358-111.000.

Thoratec Laboratories Corporation: *See*—
Ward, Robert S., Jr.; and Beckham, Donald R., 4,409,172., Cl. 264-209.200.

Thorn Emi Energy Developments Limited: *See*—
Northcote, Reginald D.; and Mehdi, Mehdi G., 4,408,566., Cl. 122-4.00D.

Thorsett, Eugene D.; and Harris, Elbert E., to Merck & Co., Inc. Substituted caprolactam derivatives as antihypertensives. 4,409,146., Cl. 260-239.30R.

Thrall Car Manufacturing Company: *See*—
Heap, James C., 4,408,542., Cl. 105-406.00R.

Threlkeld, John H.: *See*—
Anderson, Donald R.; Norstrud, Iven R.; and Threlkeld, John H., 4,408,720., Cl. 239-149.000.
Tibbits, John L.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,408,868., Cl. 355-14.00R.
Tima, Milan J.: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Tima, Milan J.; and Michael, Dietrich, 4,409,347., Cl. 524-91.000.
TLV Co., Ltd.: *See*—
Fujiwara, Katsuji, 4,408,626., Cl. 137-185.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,409,282., Cl. 428-219.000.
Tokan Kogyo Co., Ltd.: *See*—
Yoshikawa, Tsukasa; and Kitamura, Masuo, 4,408,697., Cl. 220-279.000.
Tokarz, Richard D. Temperature profile detector. 4,408,904., Cl. 374-137.000.
Tokico, Ltd.: *See*—
Nakayama, Shuzi, 4,409,459., Cl. 219-86.240.
Oshima, Harumi, 4,408,681., Cl. 188-73.380.
Tokiguchi, Katsumi: *See*—
Koike, Hidemi; Sakudo, Noriyuki; Tokiguchi, Katsumi; and Kanomata, Ichiro, 4,409,520., Cl. 315-39.000.
Tokoro, Hiroharu: *See*—
Asai, Kiyokazu; Oshima, Yujiro; Takeuchi, Akihiro; and Tokoro, Hiroharu, 4,408,479., Cl. 73-35.000.
Tokutomi, Seijiro; Nakamura, Kazuo; and Jyojiki, Kasao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting device. 4,408,853., Cl. 354-25.000.
Tokyo Kikai Seisakusho Ltd.: *See*—
Okamura, Yuichi; and Komatsu, Akitoshi, 4,408,531., Cl. 101-415.100.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Wada, Shinji; Oana, Yoshinori; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,408,847., Cl. 351-211.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Enjoji, Susumu, 4,408,611., Cl. 128-660.000.
Hayama, Yoshihiro; and Hosokawa, Yuukou, 4,408,639., Cl. 140-71.500.
Hisadome, Masanao, 4,409,575., Cl. 335-160.000.
Ike, Toshio, 4,408,826., Cl. 350-6.800.
Iwamoto, Akito; and Sekizawa, Hidekazu, 4,408,883., Cl. 356-355.000.
Kako, Takuya, 4,408,767., Cl. 277-27.000.
Kameyama, Shuichi, 4,408,388., Cl. 29-578.000.
Kanno, Ken-ichi; Gatayama, Tetsuya; and Koyama, Masao, 4,409,088., Cl. 204-402.000.
Mishima, Toshio, 4,408,512., Cl. 84-1.030.
Nagano, Katsumi, 4,409,497., Cl. 307-360.000.
Ohba, Hiroshi; and Wakamatsu, Shigeo, 4,408,934., Cl. 408-51.000.
Takano, Ikuo; Umino, Hiroshi; and Fujiwara, Junji, 4,409,449., Cl. 200-153.0SC.
Takano, Toshimasa; Hosoya, Masahiro; and Murakami, Reiji, 4,408,862., Cl. 355-3.0DD.
Takemura, Yasuhiko; and Akutsu, Fumihiko, 4,408,491., Cl. 73-626.000.
Torii, Akiomi, 4,408,458., Cl. 60-660.000.
Tsunoda, Sachio, 4,408,452., Cl. 60-398.000.
Tominaga, Shinji: *See*—
Imura, Toshinori; and Tominaga, Shinji, 4,408,855., Cl. 354-25.000.
Tomita, Koji: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,409,210., Cl. 424-177.000.
Tomita, Tamaki; Nakao, Hisaji; Nishimura, Hideo; Eto, Kunihiko; and Ohmura, Haruo, to Toyoda Koki Kabushiki Kaisha. Contact detecting apparatus. 4,408,933., Cl. 408-8.000.
Tomosada, Masahiro; and Maeshima, Katsuyoshi, to Canon Kabushiki Kaisha. Digital display device controlled by a microcomputer. 4,408,869., Cl. 355-14.00R.
Tomov, Nenad R.: *See*—
Angerer, Herman F.; and Tomov, Nenad R., 4,409,301., Cl. 429-27.000.
Tooyama, Nobuo: *See*—
Inoue, Hiroshi; and Tooyama, Nobuo, 4,409,268., Cl. 428-1.000.
Toray Industries, Incorporated: *See*—
Iwayama, Kazuyoshi; and Inoue, Takehisa, 4,409,413., Cl. 585-481.000.
Torii, Akiomi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric power generating system. 4,408,458., Cl. 60-660.000.
Toriumi, Shiro; Ishii, Kenjiro; and Yamagishi, Seiichi, to Minolta Camera Kabushiki Kaisha. Strip film handling device. 4,408,732., Cl. 242-192.000.
Torme, Helen M. Window moisture and air flow control device. 4,408,425., Cl. 52-171.000.
Torrey, Rodney J.; Astemborski, Dennis; Carner, Marshall A.; and Rose, Gerald D., to Eriez Manufacturing Company. Precipitator rapper. 4,409,007., Cl. 55-112.000.
Tosima, Soitiro; and Harada, Shigeo, to RCA Corporation. Method for the evaluation of solderability. 4,409,333., Cl. 436-2.000.
Toth, Michael R., to Kendall Company, The. Disposable garment. 4,408,357., Cl. 2-114.000.
Toy, Albert; Constantino, Louis L.; and Evans, Donald B., to United States of America, Army. Method for batch production of isostatically pressed calcium powder discs. 4,409,174., Cl. 264-313.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Noda, Toshiharu; Morita, Kaoru; Kobari, Sadami; Nakagawa, Nobuaki; Watanabe, Susumu; Katsuragi, Shigeo; Ohyama, Kunio; and Taniuchi, Masahiko, 4,409,141., Cl. 260-112.50R.
Toyo Kogyo Co., Ltd.: *See*—
Harasaki, Hayathugu, 4,408,794., Cl. 296-198.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Ohashi, Junichi, 4,408,648., Cl. 152-353.00C.
Toyo Seikan Kaisha, Ltd.: *See*—
Kitamura, Yoichi; Hotta, Hisashi; and Yurita, Chikara, 4,409,456., Cl. 219-64.000.
Tanimura, Yusaburo; and Kumasaka, Hideo, 4,409,359., Cl. 524-575.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Tomita, Tamaki; Nakao, Hisaji; Nishimura, Hideo; Eto, Kunihiko; and Ohmura, Haruo, 4,408,933., Cl. 408-8.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kosuda, Toru; Takeuchi, Yasuhiro; Matsubara, Noboru; and Takizawa, Masaki, 4,408,580., Cl. 123-90.160.
Sakakibara, Shiro; Maseki, Shinobu; Watanabe, Kazuaki; and Minemoto, Isamu, 4,408,462., Cl. 60-330.000.
Tramm, Peter C.: *See*—
Kurzrock, John W.; and Tramm, Peter C., 4,408,957., Cl. 416-237.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., to Monsanto Company. Attrition resistant bismuth-containing metal/oxygen compositions and a process for their preparation. 4,409,133., Cl. 502-354.000.
Tremont, Samuel J.: *See*—
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,409,127., Cl. 502-205.000.
Trepanier, Peter J.: *See*—
Lautensleger, Richard W.; Bingham, George R.; and Trepanier, Peter J., 4,408,423., Cl. 52-90.000.
Tromble, Ralph D.: *See*—
Carter, Gordon V.; and Tromble, Ralph D., 4,408,432., Cl. 52-718.000.
TRW Inc.: *See*—
Drutchas, Gilbert H., 4,408,963., Cl. 417-283.000.
Trybulski, Eugene J.: *See*—
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,409,390., Cl. 548-561.000.
Tschirner, Wolfgang, to Kleinewefers, Jaeggli AG. Method for continuously treating strand-like textile material in vertical loops. 4,408,362., Cl. 8-151.000.
Tsentralny Nauchno-Issledovatelsky Institut Kozhevenno-Obuvnoi Promyshlennosti: *See*—
Zhuravlev, Vadim F.; and Belov, Alexei G., 4,408,482., Cl. 73-75.000.
Tsuchie, Takanori: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,409,395., Cl. 560-179.000.
Tsuchikane, Yoshiyuki: *See*—
Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, 4,409,682., Cl. 369-3.000.
Tsuda, Hiroshi: *See*—
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.
Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,409,217., Cl. 424-246.000.
Tsuji, Yashuhiro; Wakabayashi, Kiyoshige; and Watanabe, Mitsuo, to Chugai Seiyaku Kabushiki Kaisha. Laser nephelometric system. 4,408,880., Cl. 356-338.000.
Tsujimura, Harutoshi: *See*—
Arima, Sumitsugu; Tsujimura, Harutoshi; and Fukunaga, Yukio, 4,409,584., Cl. 340-22.000.
Tsukada, Kazuhiro; and Kato, Wataru, to Sankyo Company, Limited. Highly concentrated preparations of dopa compounds. 4,409,233., Cl. 424-273.00R.
Tsunoda, Sachio, to Tokyo Shibaura Denki Kabushiki Kaisha. Pumping-up hydroelectric power plants. 4,408,452., Cl. 60-398.000.
Tsutsui, Yoshimitsu: *See*—
Kogo, Nobuhiko; Tsutsui, Yoshimitsu; Kato, Koji; and Kishigami, Hisao, 4,409,160., Cl. 264-40.100.
Tsuzuku, Susumu: *See*—
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.
Tubbs, Graham S., to Texas Instruments Incorporated. Turn-off-processor between keystrokes. 4,409,665., Cl. 364-707.000.
Tunbridge, Peter M.: *See*—
Lowis, Royce; and Tunbridge, Peter M., 4,408,384., Cl. 29-571.000.
Tung, Lu H.: *See*—
Lyons, Charles E.; and Tung, Lu H., 4,409,369., Cl. 525-314.000.
Turley, Alfred P., to Westinghouse Electric Corp. Radiant energy differential sensor system. 4,409,483., Cl. 250-332.000.
Twin-Cee Limited: *See*—
Richardson, Frank; and Campbell, Allan H., 4,408,811., Cl. 312-37.000.

Tyl, Miloslay: *See*—
Sloupensky, Jiri; and Tyl, Miloslay, 4,408,447., Cl. 57-263.000.
Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,408,465., Cl. 62-82.000.
Tyree, Charles N.; Fike, Lester L., Jr.; and McIntire, Ronald A., to Fike Metal Products Corporation. Pressure responsive electrical switching apparatus. 4,409,443., Cl. 200-83.00N.
UBE Industries, Ltd.: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,409,395., Cl. 560-179.000.
Uchida, Hiroyuki: *See*—
Nakajima, Kazuo; Hirata, Yoshiaki; Uchida, Hiroyuki; Kimizuka, Yoshie; Taniguchi, Tsutomu; Obayashi, Akira; and Tanabe, Osamu, 4,409,385., Cl. 536-123.000.
Uchikawa, Nobutaka: *See*—
Asanuma, Tadashi; Uchikawa, Nobutaka; and Shiomura, Tetsunosuke, 4,409,378., Cl. 526-125.000.
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, to Kanetsu Kogyo Kabushiki Kaisha. Magnetic chuck. 4,408,752., Cl. 269-8.000.
Uchino, Shoichi: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,409,313., Cl. 430-144.000.
Uda, Taizo: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,409,395., Cl. 560-179.000.
Ueberschaer, Horst: *See*—
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,409,394., Cl. 549-534.000.
Ueda, Yasuhiro, to Olympus Optical Co., Ltd. Endoscope with an air-liquid suction device. 4,408,598., Cl. 128-4.000.
Uhlig, Klaus; Szczurek, Marian; Vilacha, Carlos; and Beckmann, Juergen. Wedge-type tap for the sterile sampling of liquids. 4,408,631., Cl. 137-380.000.
Ujiie, Nikio: *See*—
Mizushima, Yoichi; Hosonaga, Taketoshi; Murakami, Takashi; and Ujiie, Nikio, 4,408,798., Cl. 297-326.000.
Umekawa, Osamu; Ito, Yosuke; and Katayama, Sakae, to Katayama Chemical Works Co., Ltd. Easily dispersible composition for water soluble polymer. 4,409,353., Cl. 524-421.000.
Umezawa, Seiji: *See*—
Takasugi, Tsuneji; and Umezawa, Seiji, 4,408,900., Cl. 368-295.000.
Umino, Hiroshi: *See*—
Takano, Ikuo; Umino, Hiroshi; and Fujiwara, Junji, 4,409,449., Cl. 200-153.0SC.
Unger, Herbert; and Meise, Gunther, to WABCO Fahrzeugbremsen GmbH. Piston cylinder and head for compressors. 4,408,967., Cl. 417-571.000.
Unie Van Kunstmestfabrieken BV: *See*—
Mutsers, Stanislaus M. P.; Hoek, Cornelis; and Wagemans, Gerardus M. C., 4,408,998., Cl. 23-293.00A.
Mutsers, Stanislaus M. P.; Hoek, Cornelis; and Wagemans, Gerardus M. C., 4,409,016., Cl. 71-59.000.
Union Carbide Corporation: *See*—
Ancker, Fred H.; Ashcraft, Arnold C., Jr.; Wagner, Eric R., deceased; and Wagner, Maria M., executrix, 4,409,342., Cl. 523-202.000.
Billig, Ernst; and Bryant, David R., 4,409,149., Cl. 260-429.00R.
Higgins, Thomas E., 4,409,251., Cl. 426-413.000.
Hodakowski, Leonard E., 4,409,153., Cl. 260-946.000.
Kobayashi, Hisashi; and Anderson, John E., 4,408,982., Cl. 431-10.000.
United Kingdom Atomic Energy Authority: *See*—
Heath, James H., 4,408,498., Cl. 73-861.790.
Whitehead, Norman P.; Boness, Kenneth D.; and Martin, Roger, 4,409,617., Cl. 358-147.000.
United States Gypsum Company: *See*—
Brooke, Michael E.; and Wendt, Alan C., 4,408,428., Cl. 52-489.000.
Martinelli, Lawrence R.; and Lat, Geronimo E., 4,409,276., Cl. 428-142.000.
United States of America
Air Force: *See*—
Gowan, John G., 4,408,833., Cl. 350-310.000.
Holt, James F., 4,409,423., Cl. 136-255.000.
Owen, Thomas E.; Suhler, Sidney A.; and Peters, Wendell R., 4,408,533., Cl. 102-211.000.
Romanski, John G., 4,409,661., Cl. 364-516.000.
Salour, Michael M.; and Roxlo, Charles B., 4,408,464., Cl. 62-514.00R.
Scott, Robert G., 4,409,587., Cl. 340-347.0DD.
Sidey, Roger, 4,408,481., Cl. 73-73.000.
Army: *See*—
Toy, Albert; Constantino, Louis L.; and Evans, Donald B., 4,409,174., Cl. 264-313.000.
Interior: *See*—
Borrowman, S. Ralph; Altringer, Paulette B.; and Brooks, Parkman T., 4,409,189., Cl. 423-54.000.
Holman, James L., Jr.; and Neumeier, Leander A., 4,409,020., Cl. 75-0.50B.
National Aeronautics and Space Administration: *See*—
Holland, Lawrence R., 4,408,658., Cl. 165-2.000.
Tenney, John B., Jr., 4,408,597., Cl. 128-1.00R.
Navy: *See*—
Howarth, Robert F., 4,409,474., Cl. 250-207.000.
Howe, David G., 4,409,297., Cl. 428-614.000.
Jelks, Edward C.; and Kerber, George L., 4,409,262., Cl. 427-99.000.
Keller, Teddy M., 4,409,382., Cl. 528-173.000.
Koon, Norman C., 4,409,043., Cl. 148-403.000.
Morris, Hayden; and Christianson, Charles, 4,409,485., Cl. 250-374.000.
Sheem, Sang K., 4,408,882., Cl. 356-350.000.
Swales, Frank, deceased; and Swales, Doris, heir, 4,408,536., Cl. 102-379.000.
Williams, Harry S.; Yates, Jan B.; Reidy, John J.; Faccini, Ernest; Hill, Terry E.; and Shafley, William K., 4,408,405., Cl. 37-62.000.
Wutherich, Hermann A., 4,408,830., Cl. 350-247.000.
Yoder, Max N., 4,409,608., Cl. 357-51.000.
U.S. Philips Corporation: *See*—
Bates, Terence, 4,409,486., Cl. 250-396.0ML.
Beelaard, Wilhelmus A. J.; and Vink, Nicolaas G., 4,409,578., Cl. 335-210.000.
Knijnenburg, Johannus P. H.; and Verhoeven, Bernardus, 4,409,558., Cl. 330-288.000.
Lowis, Royce; and Tunbridge, Peter M., 4,408,384., Cl. 29-571.000.
Milsom, Robert F.; Murray, Robert J.; and Flinn, Ian, 4,409,571., Cl. 333-196.000.
Van Der Sande, Johannes H. M.; Sools, Franciscus G. P.; and Campbell, Ronald J., 4,409,517., Cl. 313-631.000.
Van Kessel, Theodorus J., 4,409,556., Cl. 330-75.000.
Wagenaar, Kornelis J.; De Graaff, Hendrik C.; and Appels, Johannes A., 4,409,606., Cl. 357-13.000.
Warmuth, Leo, 4,409,612., Cl. 358-24.000.
United Technologies Corporation: *See*—
Clarady, Joseph F., Jr.; Jessee, Karen L.; and Bearden, Joe L., 4,408,881., Cl. 356-347.000.
Guthrie, Richard W.; and Byrne, Dale M., 4,408,827., Cl. 350-96.100.
Hartman, Paul R.; and Milam, Thomas B., 4,408,832., Cl. 350-310.000.
Herndon, James A.; and Ask, Henry R., 4,409,670., Cl. 364-900.000.
Ryan, Edward J., 4,409,054., Cl. 156-293.000.
Taylor, Kenneth E., 4,409,451., Cl. 219-10.49R.
Unitek Corporation: *See*—
Cleary, James D., 4,408,989., Cl. 433-7.000.
University of Utah: *See*—
Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., 4,409,090., Cl. 208-11.0LE.
UOP Inc.: *See*—
Latos, Edwin J.; and Payne, John C., 4,409,121., Cl. 252-389.00A.
LeRoy, Charles F., 4,409,033., Cl. 127-46.200.
Peters, Kenneth D., 4,409,095., Cl. 208-134.000.
Qualeatti, Gail M.; and Germanas, Dalia, 4,409,148., Cl. 260-409.000.
Upperman, Gary V.; and Withers, James C., to Metallurgical, Inc. Cell with composite anode for electrolytic production of magnesium. 4,409,083., Cl. 204-245.000.
Urich, Oren D.: *See*—
Keller, Phillip D.; Urich, Oren D.; and Mahagan, Deroy E., 4,408,551., Cl. 111-85.000.
Urino, Yoshiteru: *See*—
Watanabe, Hisashi; Urino, Yoshiteru; and Aotsu, Shinichi, 4,409,633., Cl. 360-127.000.
Urmy, Charles W., Jr., to Dresser Industries, Inc. Lubricant, slow speed, high load. 4,409,112., Cl. 252-33.400.
USM Corporation: *See*—
Szewczyk, Richard S., 4,408,507., Cl. 82-36.00A.
Usui, Taiji: *See*—
Takayashiki, Tetsuya; Usui, Taiji; and Sakurai, Tetsuma, 4,408,386., Cl. 29-576.00E.
Utsugi, Mikio, to Olympus Optical Co., Ltd. Ultrasonic scanning device for examining viscera. 4,408,612., Cl. 128-660.000.
V. L. Churchill Limited: *See*—
Darwood, Phillip I.; Holland, Ernest; Taylor, Peter M.; and Marley, Christopher, 4,408,399., Cl. 33-203.180.
Vaillant, Robert: *See*—
Ninet, Jean-Louis; and Vaillant, Robert, 4,408,930., Cl. 405-209.000.
Vale, Wylie W., Jr.: *See*—
Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,409,208., Cl. 424-177.000.
Valley View Specialties Co.: *See*—
Rynberk, Robert W., 4,408,717., Cl. 239-18.000.
van Berkum, Petrus A.: *See*—
Hirshorn, Michael S.; Skalsky, Michael; van Berkum, Petrus A.; Holley, Loraine K.; and Money, David K., 4,408,604., Cl. 128-785.000.
Vandegraaf, Johannes J., to General Electric Company. Phase locked loop frequency synthesizer with frequency compression loop. 4,409,563., Cl. 331-11.000.
van de Mond, Theodorus J.: *See*—
Kleuskens, Engelina C.; Maessen, Johannes G. H.; and van de Mond, Theodorus J., 4,409,122., Cl. 502-20.000.
van der Lely, Cornelis. Time clock for recording the identification of a person. 4,409,657., Cl. 364-401.000.

Vanderpool, Clarence D.; and MacInnis, Martin B., to GTE Products Corporation. Method for producing cobalt metal powder. 4,409,019., Cl. 75-0.5AA.
Van Der Sande, Johannes H. M.; Sools, Franciscus G. P.; and Campbell, Ronald J., to U.S. Philips Corporation. High-pressure discharge lamp with envelope lead-through structure. 4,409,517., Cl. 313-631.000.
van der Wiel, Adrianus W., to Vredestein N.V. Fender, respectively plug for a fender. 4,408,556., Cl. 114-219.000.
van Drumpt, Jan D.: *See*—
Beijleveld, Wilhelmus M.; and van Drumpt, Jan D., 4,409,367., Cl. 525-277.000.
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, to Chemische Werke Huls AG. Supported silver catalysts mixed with promoter metal compounds for the production of ethylene oxide. 4,409,394., Cl. 549-534.000.
Van Hulle, Glenn J.; Anker, Charles A.; and Franssell, Dean E., to General Mills, Inc. Method for preparing sugar coated, puffed snacks upon microwave heating. 4,409,250., Cl. 426-242.000.
Van Kessel, Theodorus J., to U.S. Philips Corporation. Amplifier arrangement with very low distortion. 4,409,556., Cl. 330-75.000.
Van Kesteren, John, Jr. Apparatus for packing and compressing fresh spinach, or the like. 4,408,440., Cl. 53-527.000.
Van Leirsburg, Dean A., to Chevron Research Company. Extracting cobalt from spent hydroprocessing catalysts with cyanide. 4,409,190., Cl. 423-150.000.
Van Manen, Dick T., to Voplex Corporation. Method for molding a composite foamed resin pull strap. 4,409,163., Cl. 264-45.500.
Van Pool, Joe; and Potts, Mack F., to Phillips Petroleum Company. Relief system. 4,409,420., Cl. 585-723.000.
van Rinsum, Cornelis, to MTU Motoren- und Turbinen-Union Friedrichshaften GmbH. Fuel injection pump. 4,408,586., Cl. 123-446.000.
Varano, Joseph J.: *See*—
Faber, Dolan D.; Holmes, Richard G.; and Varano, Joseph J., 4,408,558., Cl. 118-59.000.
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William Prym-Werke KG: *See*—
von Agris, Rudolf; Kaiser, Gunter; and Nysten, Bernhard, 4,409,052., Cl. 156-227.000.

Williams, Harry S.; Yates, Jan B.; Reidy, John J.; Faccini, Ernest; Hill, Terry E.; and Shafley, William K., to United States of America, Navy. Underwater excavator. 4,408,405., Cl. 37-62.000.

Williams, James H., to Borden, Inc. Wood composites of low formaldehyde emission. 4,409,293., Cl. 428-524.000.

Williams, James W.: *See*—
Berti, John C.; and Williams, James W., 4,409,687., Cl. 455-7.000.

Williams, Roger F., to Mobile Companies, Inc. Cryogenic cleaning process. 4,409,034., Cl. 134-4.000.

Williams, Rollie B.: *See*—
Nadkarni, Ramachandra A.; and Williams, Rollie B., 4,408,999., Cl. 44-1.0SR.

Williamson, Herman L., to Hi-Shear Corporation. Torque-limited threaded locking fastener, and method for setting the same. 4,408,936., Cl. 411-3.000.

Wilson, Brown L.; and Carle, Joseph T., to Oil Dynamics, Inc. Tandem connected submersible oil well pump motors. 4,409,504., Cl. 310-87.000.

Wimmer, Anton: *See*—
Schaper, Siegfried; Wimmer, Anton; and Dommes, Werner, 4,408,380., Cl. 29-156.50A.

Winchip, Galen J., to Iowa State University Research Foundation, Inc. Cantilevered sliding table. 4,408,509., Cl. 83-435.100.

Wiredal, Harry A. I., to Sandvik Aktiebolag. Means for drilling. 4,408,669., Cl. 175-258.000.

Wise, Richard M., to General Tire & Rubber Company, The. Adhesion of rubber to glass fibers. 4,409,290., Cl. 428-378.000.

Wise, Richard M., to General Tire & Rubber Company, The. Adhesion of rubber to glass fibers. 4,409,343., Cl. 523-206.000.

Wissmann, Michael, to Robert Bosch GmbH. Fuel injection system. 4,408,587., Cl. 123-454.000.

Withers, James C.: *See*—
Upperman, Gary V.; and Withers, James C., 4,409,083., Cl. 204-245.000.

Witty, Brian H., to Mantis Excavators, Ltd. Mechanical digger. 4,408,949., Cl. 414-694.000.

Witzel, Frank; DiNolfo, Mario A.; Rodney, Burton; and Mackay, Donald A. M., to Nabisco Brands, Inc. Breath freshener composition and method. 4,409,202., Cl. 424-49.000.

Witzel, Homer D. Axial flow rotary separator. 4,408,618., Cl. 130-23.000.

Wobbermin, Hubertus: *See*—
Krause, Helmfried; Wobbermin, Hubertus; and Geigle, Edgar, deceased, 4,409,185., Cl. 422-113.000.

Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, to Chimicasa GmbH. Protection of microorganisms against bacteriophage virus attacks. 4,409,245., Cl. 426-9.000.

Wolff, Erland, to Jude Engineering, Inc. Stuffing box with outer flexible tube to allow shaft gyratory movements. 4,408,769., Cl. 277-105.000.

Wolff, Kurt, to Steinhaus GmbH. Sieve deck for sifting machines. 4,409,099., Cl. 209-399.000.

Wolff, Martin J.; and Falvo, Joseph S., to Dart Industries Inc. Corn buttering and salting apparatus. 4,408,919., Cl. 401-12.000.

Wons, Hubert; and Sitzler, Hans-Dietrich, to G. Siempelkamp GmbH & Co. Apparatus for measuring platen-press bend in platen press. 4,408,520., Cl. 100-93.00P.

Wood, Derek A., to Shell Internationale Research Maatschappij B.V. Preparation of cyanobenzyl cyclopropane carboxylates. 4,409,150., Cl. 260-465.00D.

Woodard, Kenneth E., Jr.: *See*—
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,409,085., Cl. 204-257.000.

Woodward, Thomas R., to Burroughs Corporation. Programmable multiplexer. 4,409,683., Cl. 370-112.000.

Worf, Douglas L. Heat exchange system. 4,408,596., Cl. 126-428.000.

Worm, Manfred: *See*—
Martin, Lawrence L.; Worm, Manfred; and Crichlow, Charles A., 4,409,145., Cl. 260-239.0BD.

Wutherich, Hermann A., to United States of America, Navy. Multidirectional translator mechanism. 4,408,830., Cl. 350-247.000.

Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K. Furnace wall ash monitoring system. 4,408,568., Cl. 122-379.000.

Xerox Corporation: *See*—
Goffe, Wiliam L., 4,409,603., Cl. 346-155.000.
Hardenbrook, James M., 4,408,864., Cl. 355-3.0TE.
Kingsley, William, 4,409,624., Cl. 358-285.000.
Rumennik, Vladimir, 4,409,607., Cl. 357-23.000.
Sprague, Robert A.; and Scifres, Donald R., 4,409,479., Cl. 250-237.00G.
Swigert, J. Kirk; and Pochan, Darlyn F., 4,409,598., Cl. 346-74.200.

Yabuhara, Hideo; and Kudo, Ichiro, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Air-fuel ratio control system. 4,408,584., Cl. 123-440.000.

Yagihara, Morio; Hirano, Tsumoru; Mihayashi, Keiji; and Ozawa, Takashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,409,320., Cl. 430-381.000.

Yama, Frank M.: *See*—
Hofer, Alan; and Yama, Frank M., 4,409,588., Cl. 340-384.00R.

Yamada, Naoki: *See*—
Wada, Kenichi; and Yamada, Naoki, 4,409,654., Cl. 364-200.000.

Yamada, Yasuyuki: *See*—
Ogawa, Hiroshi; Kasuga, Akira; Tamai, Yasuo; and Yamada, Yasuyuki, 4,409,291., Cl. 428-425.900.

Yamada, Yoshiro; Hatsuoka, Nobuyasu; and Ashida, Shinzo, to Kabushiki Kaisha Kobe Seiko Sho. Spring steel for vehicles. 4,409,026., Cl. 75-124.000.

Yamagami, Tamotsu: *See*—
Yamauchi, Hiroyuki; and Yamagami, Tamotsu, 4,409,526., Cl. 318-254.000.

Yamagata, Shinji: *See*—
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,444., Cl. 200-144.00R.
Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,409,445., Cl. 200-144.00R.

Yamagishi, Seiichi: *See*—
Toriumi, Shiro; Ishii, Kenjiro; and Yamagishi, Seiichi, 4,408,732., Cl. 242-192.000.

Yamaguchi, Kenzo; Ichisaka, Teruo; and Ikegami, Tadao, to Chlorine Engineers Corp. Ltd. Electrolytic cell for ion exchange membrane method. 4,409,084., Cl. 204-257.000.

Yamaguchi, Kunihiro: *See*—
Moteki, Tsutomu; Aoki, Kazuo; Yamaguchi, Kunihiro; and Yoshizaki, Michio, 4,409,345., Cl. 524-13.000.

Yamaji, Kazunori: *See*—
Nakamura, Takashi; Morioka, Yoshihiro; Yamaji, Kazunori; Nakamura, Takashi; Morioka, Yoshihiro; and Yamaji, Kazunori, 4,409,613., Cl. 358-51.000.
Nakamura, Takashi; Morioka, Yoshihiro; Yamaji, Kazunori; Nakamura, Takashi; Morioka, Yoshihiro; and Yamaji, Kazunori, 4,409,613., Cl. 358-51.000.

Yamakawa, Norio: *See*—
Ooki, Norihiro; Takahashi, Noriyoshi; Wachi, Yasuyuki; Takikawa, Yoshio; Yamakawa, Norio; and Motegi, Shoji, 4,409,508., Cl. 310-239.000.

Yamamoto, Hideyuki; Nishikawa, Waichi; and Nagasaka, Moritoshi, to Osaka Transformer Co., Ltd. Pulse arc welding method and device in which pulse current and background current have a constant current characteristic. 4,409,465., Cl. 219-137.0PS.

Yamamoto, Shu: *See*—
Sakaguchi, Haruo; Seki, Norio; Yamamoto, Shu; and Wakabayashi, Hiroharu, 4,408,831., Cl. 350-269.000.

Yamamoto, Taizo; and Ishida, Tetsuhisa, to Nippon Elanco Kabushiki Kaisha. Apparatus for filling viscous substances into hard gelatin capsules. 4,408,641., Cl. 141-82.000.

Yamamoto, Tetsuji: *See*—
Kobayashi, Makoto; Yamamoto, Tetsuji; and Jimbo, Yoshihiro, 4,409,623., Cl. 358-261.000.

Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,214., Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,409,215., Cl. 424-246.000.

Yamane, Yasuhide, to Teikoku Chuck Co., Ltd. Device for securing dies. 4,408,522., Cl. 100-295.000.

Yamaoka, Kishihiro. Continuous kneader. 4,408,887., Cl. 366-75.000.

Yamasaki, Masafumi, to Olympus Optical Company Ltd. Automatic exposure controller for camera of TTL direct photometry type. 4,408,852., Cl. 354-24.000.

Yamashita, Seizi: *See*—
Ito, Motoya; Fujimoto, Noboru; Takahashi, Noriyoshi; Watanabe, Masatoshi; and Yamashita, Seizi, 4,409,506., Cl. 310-166.000.

Yamauchi, Hiroyuki; and Yamagami, Tamotsu, to Sony Corporation. Brushless DC motor. 4,409,526., Cl. 318-254.000.

Yamazaki, Masaru: *See*—
Miyashita, Kiyoshi; Kasuga, Muneo; Shimizu, Akira; Ozeki, Fumitaka; Tsuda, Hiroshi; Kimura, Katsuhiko; Hattori, Nobuoto; Amemiya, Norio; and Yamazaki, Masaru, 4,408,756., Cl. 271-288.000.

Yamazaki, Shunpei. Photoelectric conversion semiconductor and manufacturing method thereof. 4,409,134., Cl. 252-501.100.

Yamazaki, Tamotsu: *See*—
Fujimura, Yasuo; Tanaka, Sadao; Matsunaga, Isao; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Hata, Shun-ichi; Shindo, Minoru; and Sakai, Kazushige, 4,409,234., Cl. 424-273.00N.

Yanagisawa, Kiyoshi: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,408,752., Cl. 269-8.000.

Yano, Tadashi; and Hoshino, Noriyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Automatic printing plate exchange system. 4,408,530., Cl. 101-415.100.

Yarm, Jay M., to Pitney Bowes Inc. Sheet separating device. 4,408,757., Cl. 271-311.000.

Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, to Sharp Kabushiki Kaisha. Optical bar code reader. 4,409,469., Cl. 235-463.000.

Yasuda, Takeshi; and Watanabe, Kazuyoshi, to Casio Computer Co., Ltd. Printing control device for thermal printer. 4,409,599., Cl. 346-76.0PH.

Yasuda, Yasushi: *See*—
Enomoto, Hiromu; Mitono, Yoshiharu; Yasuda, Yasushi; Imaizumi, Taketo; and Ohta, Hiroshi, 4,409,495., Cl. 307-290.000.

Yasumura, Masayuki, to Sony Corporation. Pincushion distortion correction apparatus. 4,409,523., Cl. 315-371.000.

Yates, Jan B.: *See*—
Williams, Harry S.; Yates, Jan B.; Reidy, John J.; Faccini, Ernest; Hill, Terry E.; and Shafley, William K., 4,408,405., Cl. 37-62.000.

Yatsunami, Kenrow: *See*—
Yasuda, Syoichi; Okamoto, Takaaki; Yatsunami, Kenrow; Terashima, Shigeo; Horii, Masahiro; Iwamoto, Yoshihiko; and Amasaki, Kiyotsugu, 4,409,469., Cl. 235-463.000.

Ying, Shao-Yao: *See*—
Ling, Nicholas C.; Guillemin, Roger C. L.; Ying, Shao-Yao; and Esch, Frederick S., 4,409,139., Cl. 260-112.00R.

Yoda, Kuniichi: *See*—
Ohkawa, Takehisa; and Yoda, Kuniichi, 4,409,300., Cl. 428-695.000.

Yoder, Max N., to United States of America, Navy. Recessed interdigitated integrated capacitor. 4,409,608., Cl. 357-51.000.

Yogev, Amnon. Heat storage pond and power plant using same. 4,408,459., Cl. 60-641.800.

Yokono, Hitoshi: *See*—
Hira, Yasuo; Tsuzuku, Susumu; Iida, Makoto; Gotoh, Masao; Yokono, Hitoshi; Kimura, Yoshikazu; and Iijima, Kazumi, 4,409,341., Cl. 521-162.000.

Yokoyama, Hideo; Shimbashi, Ichiro; Sakurai, Koichi; and Matsuo, Munetsugu, to Nippon Steel Corporation. Dual-purpose plant for producing cold rolled steel sheet and hot-dip galvanized steel sheet. 4,408,561., Cl. 118-72.000.

Yonkers, Edward, to Data Packaging Corporation. Ribbon cartridge with shield. 4,408,912., Cl. 400-208.000.

Yoon, Heeyoung; and Jackson, Robert G., to Conoco Inc. Ether cold starter in alcohol fuel treatment and distribution apparatus and method. 4,408,572., Cl. 123-3.000.

Yoon, Heeyoung: *See*—
Jackson, Robert G.; and Yoon, Heeyoung, 4,408,571., Cl. 123-3.000.

Yoshida, Junichi, to Casio Computer Co., Ltd. Round-off apparatus for data processors. 4,409,668., Cl. 364-745.000.

Yoshikawa, Tsukasa; and Kitamura, Masuo, to Tokan Kogyo Co., Ltd. Opening means having cutting guide. 4,408,697., Cl. 220-279.000.

Yoshikawa, Yukio: *See*—
Suzuki, Akira; Yoshikawa, Yukio; and Kaneko, Katumi, 4,408,856., Cl. 354-234.000.

Yoshimoto, Teruo: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,409,025., Cl. 420-584.000.

Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, to Nippon Soken, Inc. Ignition system for internal combustion engines. 4,408,592., Cl. 123-625.000.

Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,409,444., Cl. 200-144.00R.

Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,409,445., Cl. 200-144.00R.

Yoshizaki, Michio: *See*—
Moteki, Tsutomu; Aoki, Kazuo; Yamaguchi, Kunihiro; and Yoshizaki, Michio, 4,409,345., Cl. 524-13.000.

Ystebo, Stuart. Storage bin floor structure. 4,408,426., Cl. 52-245.000.

Yu, Cheng-Der, to Syntex (U.S.A.) Inc. Propylene glycol diester solutions of PGE-type compounds. 4,409,239., Cl. 424-305.000.

Yu, Kenneth K.: *See*—
Bohr, Mark T.; Yu, Kenneth K.; Chwang, Ronald J. C.; and Berglund, C. Neil, 4,409,259., Cl. 427-38.000.

Yui, Tomoyuki: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; Fujimoto, Tsuneo; and Kubota, Minoru, 4,409,197., Cl. 423-415.00P.

Yurita, Chikara: *See*—
Kitamura, Yoichi; Hotta, Hisashi; and Yurita, Chikara, 4,409,456., Cl. 219-64.000.

Zabler, Erich: *See*—
Hauler, Peter; Heintz, Frieder; and Zabler, Erich, 4,408,589., Cl. 123-494.000.

Zalucha, Denis J.; Sexsmith, Frederick H.; and Howard, Dennis D., to Lord Corporation. Thermally-responsive polymeric materials. 4,409,383., Cl. 528-499.000.

Zapisek, John M.; and Giulekas, Gus, to Standard Microsystems Corporation. High-speed merged plane logic function array. 4,409,499., Cl. 307-468.000.

Zehnpfennig, Theodore F., to Visidyne, Inc. Spatial frequency filter. 4,409,475., Cl. 250-224.000.

Zeller-Pendrey, Jeanine I.; Skinner, Mark C.; and Morgan, David A., to Minnesota Mining and Manufacturing Company. Resistively heatable photothermographic element with strippable layer. 4,409,316., Cl. 430-263.000.

Zhuravlev, Vadim F.; and Belov, Alexei G., to Tsentralny Nauchno-Issledovatelsky Institut Kozhevenno-Obuvnoi Promyshlennosti. Method and apparatus for the determination of moisture content of fibrous and granular materials. 4,408,482., Cl. 73-75.000.

Zieg, Steven A., to Mansion Industries, Inc. Variable pitch railing and system. 4,408,749., Cl. 256-67.000.

Ziegenhorn, Joachim; Bartl, Knut; Roder, Albert; Lang, Gunter; Mollering, Hans; and Nagele, Ulrich, to Boehringer Mannheim GmbH. Method and reagent for the determination of glycerol. 4,409,328., Cl. 435-25.000.

Ziegenhorn, Joachim: *See*—
Bartl, Knut; Lill, Helmut; Roeschlau, Peter; and Ziegenhorn, Joachim, 4,409,327., Cl. 435-13.000.

Zielasek, Adelbert: *See*—
Bartholdsten, Dieter; Koop, Hermann; Schrode, Erhard; and Zielasek, Adelbert, 4,409,169., Cl. 264-107.000.

Zilch, Gregory W., to Donn Incorporated. Framing system for demountable walls or the like. 4,408,427., Cl. 52-481.000.

Zinky, William; and Rosenberg, Larry, to Computervision Corporation. Projection aligner with specific means for bending mirror. 4,408,874., Cl. 355-52.000.

Zolavvar, Ruperto B.: *See*—
Ciesiel, Allen R.; LaSpesa, Richard E.; and Zolavvar, Ruperto B., 4,408,914., Cl. 400-208.000.

Zondler, Rolf: *See*—
Beckerle, Heinz; Huster, Lothar; and Zondler, Rolf, 4,409,352., Cl. 524-405.000.
Gerstle, Volker; Mauz, Gerhard; and Zondler, Rolf, 4,409,306., Cl. 430-28.000.

Zultzke, Walter: *See*—
Heimbach, Klaus-Jurgen; and Zultzke, Walter, 4,408,563., Cl. 118-692.000.

Zwicker, Roger D., to Victor Equipment Company. Utility torch having head mixer. 4,409,002., Cl. 48-180.00F.

Zylka, Kenneth R.: *See*—
Crouch, Bill W.; Sauer, William F.; and Zylka, Kenneth R., 4,408,437., Cl. 53-431.000.

501 Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See*—
Deprez, Michel; Fromion, Andre; Hardouin, Claude; and Vilas Boas, Jean C., 4,408,835., Cl. 350-117.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF OCTOBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bartholomew, Ralph L.: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., Re. 31,411., Cl. 252-501.100.

Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., to General Electric Company. Radiation curable inks. Re. 31,411., Cl. 252-501.100.

Bowden, William L.: *See*—
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., Re. 31,414., Cl. 429-101.000.

Crist, Norman B. Universal recessed wall cabinet. Re. 31,409., Cl. 312-242.000.

Czech, Joachim; and Sieghart, Hans D., to Czech, Joachim. Dispenser for paste-like products with a manually actuatable piston. Re. 31,408., Cl. 222-341.000.

Dey, Arabinda N.; Miller, John S.; and Bowden, William L., to Duracell Inc. Electrolyte salts for non aqueous electrochemical cells. Re. 31,414., Cl. 429-101.000.

Duracell Inc.: *See*—
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., Re. 31,414., Cl. 429-101.000.

General Electric Company: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., Re. 31,411., Cl. 252-501.100.

Gould Inc.: *See*—
Jaggard, Arthur M., Re. 31,413., Cl. 429-27.000.

Gray, Thomas J., to Olin Corporation. Raney alloy coated cathode for chlor-alkali cells. Re. 31,410., Cl. 204-290.00R.

Hatano, Yoshihiro; and Yamamoto, Kenji, to Yamamoto Kagaku Gosei Kabushiki Kaisha. Pressure-and-heat-sensitive copying paper. Re. 31,412., Cl. 428-537.000.

Jaggard, Arthur M., to Gould Inc. Gas depolarized electrochemical cells and method of assembly. Re. 31,413., Cl. 429-27.000.

Lucas, Gary M.: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., Re. 31,411., Cl. 252-501.100.

Miller, John S.: *See*—
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., Re. 31,414., Cl. 429-101.000.

Olin Corporation: *See*—
Gray, Thomas J., Re. 31,410., Cl. 204-290.00R.

Price, David B.; and Shine, Wathena L., to Scovill Inc. Convenience food toaster operable at different wattage levels. Re. 31,415., Cl. 219-494.000.

Scovill Inc.: *See*—
Price, David B.; and Shine, Wathena L., Re. 31,415., Cl. 219-494.000.

Shine, Wathena L.: *See*—
Price, David B.; and Shine, Wathena L., Re. 31,415., Cl. 219-494.000.

Sieghart, Hans D.: *See*—
Czech, Joachim; and Sieghart, Hans D., Re. 31,408., Cl. 222-341.000.

Yamamoto Kagaku Gosei Kabushiki Kaisha: *See*—
Hatano, Yoshihiro; and Yamamoto, Kenji, Re. 31,412., Cl. 428-537.000.

Yamamoto, Kenji: *See*—
Hatano, Yoshihiro; and Yamamoto, Kenji, Re. 31,412., Cl. 428-537.000.

LIST OF REEXAM PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

I.B.P. Industrie Buitoni Perugina S.p.A.: *See*—
Mangano, Santi F., B1 4,287,216., Cl. 426-96.000.

Mangano, Santi F., to I.B.P. Industrie Buitoni Perugina S.p.A. Chocolate confection containing carbonated hard candy crystals dispersed therein. B1 4,287,216., 10-11-83, Cl. 426-96.000.

Nady, John. Wireless transmission system. B1 4,215,431., 10-11-83, Cl. 455-43.000.

Nippon Electric Co., Ltd.: *See*—
Ueda, Kazuyoshi, B1 4,266,236., Cl. 357-34.000.

Ueda, Kazuyoshi, to Nippon Electric Co., Ltd. Transistor having emitter resistors for stabilization at high power operation. B1 4,266,236., 10-11-83, Cl. 357-34.000.

LIST OF DESIGN PATENTEES

Advertising Displays Company: *See*—
Zaro, Marvin, 270,881., Cl. D6-181.000.

Aggarwal, Raj K.: *See*—
Mehra, Ravinder C.; Hahn, Heinz W.; and Aggarwal, Raj K., 270,947., Cl. D24-57.000.

Allen, Philip R.: *See*—
Porter, Terence F.; and Allen, Philip R., 270,937., Cl. D23-97.000.

Allgeyer, David F.; Johnson, Philip P.; and Gilliom, John W., to UMC Industries, Inc. Disposable pan for heating and serving food. 270,887., 10-11-83, Cl. D7-359.000.

Allware Agencies Limited: *See*—
McCain, Lawrence G., 270,942., Cl. D23-158.000.

American Home Products Corporation: *See*—
Cassini, Oleg L., 270,888., Cl. D7-137.000.
Cassini, Oleg L., 270,889., Cl. D7-137.000.

American Optical Corporation: *See*—
Maryyanek, Richard D.; and Zdrok, Joseph Z., 270,957., Cl. D29-7.000.

Analtech, Incorporated: *See*—
Felton, Herman R., 270,902., Cl. D10-81.000.

APM Corporation: *See*—
Morse, Milton, 270,910., Cl. D14-66.000.

Applied Power Inc.: *See*—
Sessody, Donald W., 270,912., Cl. D15-7.000.

Astergard, Bror O. Game board. 270,922., 10-11-83, Cl. D21-31.000.

Baillod, Frederic. Storage container for small articles. 270,896., 10-11-83, Cl. D9-349.000.

Bebb, Hubert: *See*—
Denton, William S., Jr.; Shell, Donald P.; and Bebb, Hubert, 270,949., Cl. D25-6.000.

Bliss & Laughlin Industries Incorporated: *See*—
Hawes, Daniel D.; and Massey, Edward W., 270,963., Cl. D34-40.000.

Bovenizer, Patrick J.: *See*—
Peterson, Richard H.; Bovenizer, Patrick J.; Jensen, Richard W.; and Hass, William H., 270,917., Cl. D17-9.000.

Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., to Raytheon Company. Tray for microwave steaming utensil. 270,893., 10-11-83, Cl. D7-409.000.

Branom, Donald F. Game target. 270,920., 10-11-83, Cl. D21-5.000.

Brauer, Lisa. Simulative pacifier. 270,946., 10-11-83, Cl. D24-45.000.

Brossier, Jean-Michel. Backpacker's tent. 270,928., 10-11-83, Cl. D21-253.000.

Brown Group Recreational Products, Inc.: *See*—
Carlson, Harold W., 270,927., Cl. D21-244.000.

Carlson, Harold W., to Brown Group Recreational Products, Inc. Child's outdoor play gym. 270,927., 10-11-83, Cl. D21-244.000.

Casablanca Fan Company, Inc.: *See*—
Dennis, Warren E., 270,943., Cl. D23-163.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 270,888., 10-11-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 270,889., 10-11-83, Cl. D7-137.000.

Chan, Kai C.: *See*—
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73 4,408,481
75 4,408,482
115 4,408,483
149 4,408,484
155 4,408,485
4,408,486
170 A 4,408,488
432 R 4,408,489
497 4,408,490
626 4,408,491
631 4,408,492
643 4,408,493
646 4,408,494
655 4,408,495
728 4,408,496
861.17 4,408,497
861.79 4,408,498

CLASS 74

527 4,408,499
572 4,408,500
688 4,408,501
789 4,408,502
798 4,408,503

CLASS 75

0.5 AA 4,409,019
0.5 B 4,409,020
10 R 4,409,021
36 4,409,022
38 4,409,023
60 4,409,024
124 4,409,026
128 W 4,409,027
130 R 4,409,028

CLASS 81

59.1 4,408,504
98 4,408,505

CLASS 82

20 4,408,506
36 A 4,408,507
476 4,408,468

CLASS 83

397 4,408,508
435.1 4,408,509
869 4,408,510

CLASS 84

1.01 4,408,511
1.03 4,408,512
1.15 4,408,513
1.24 4,408,514
267 4,408,515
275 4,408,516
345 4,408,517

CLASS 91

31 4,408,518

CLASS 99

486 4,408,519

CLASS 100

93 P 4,408,520
229 R 4,408,521
295 4,408,522

CLASS 101

56 4,408,523
110 4,408,524
183 4,408,525
216 4,408,526
350 4,408,527
364 4,408,528
415.1 4,408,529
4,408,530
4,408,531
456 4,408,532

CLASS 102

211 4,408,533
288 4,408,534
305 4,408,535
379 4,408,536
395 4,408,537
522 4,408,538

CLASS 104

89 4,408,539
172 B 4,408,540

CLASS 105

199 R 4,408,541
406 R 4,408,542

CLASS 106

20 4,409,039
4,409,040
97 4,409,030

CLASS 108

24 4,408,543
53.3 4,408,544

CLASS 109

50 4,408,545
75 4,408,546

CLASS 110

234 4,408,547
347 4,408,548

CLASS 111

2 4,408,549
4,408,550
85 4,408,551

CLASS 112

119 4,408,552
158 A 4,408,553
302 4,408,554

CLASS 114

150 4,408,555
219 4,408,556

CLASS 116

206 4,408,557

CLASS 118

59 4,408,558
60 4,408,559
69 4,408,560
72 4,408,561
4,408,562
692 4,408,563

CLASS 119

14.08 4,408,564
52 R 4,408,565

CLASS 122

4 D 4,408,566
14 4,408,567
379 4,408,568
448 R 4,408,569
510 4,408,570

CLASS 123

3 4,408,571
4,408,572
25 P 4,408,573
26 4,408,574
41.35 4,408,575
52 MB 4,408,576
55 AA 4,408,577
56 R 4,408,578
73 V 4,408,579
90.16 4,408,580
339 4,408,581
415 4,408,582
4,408,583
440 4,408,584
4,408,585
446 4,408,586
454 4,408,587
489 4,408,588
494 4,408,589
502 4,408,590
4,408,591
625 4,408,592

CLASS 126

85 R 4,408,593
121 4,408,594
424 4,408,595
428 4,408,596

CLASS 127

19 4,409,031
37 4,409,032
46.2 4,409,033

CLASS 128

1 R 4,408,597
4 4,408,598
24 R 4,408,599
80 R 4,408,600
92 D 4,408,601
303.1 4,408,602
325 4,408,603
402 4,408,605
419 PG 4,408,606
419 R 4,408,607
421 4,408,608
4,408,609
642 4,408,610
660 4,408,611
4,408,612
670 4,408,613
680 4,408,614
696 4,408,615
731 4,408,616
735 4,408,617
785 4,408,604

CLASS 130

23 4,408,618

CLASS 131

108 4,408,619
236 4,408,620
282 4,408,621

CLASS 132

73 4,408,622
73.6 4,408,623

CLASS 134

4 4,409,034
6 4,409,035
133 4,408,624
144 4,408,625

CLASS 136

244 4,409,422
255 4,409,423
258 4,409,424

CLASS 137

185 4,408,626
242 4,408,627
312 4,408,628
329.04 4,408,629
340 4,408,630
380 4,408,631
516.29 4,408,632
596.2 4,408,633
630.12 4,408,634

CLASS 138

30 4,408,635
94 4,408,636

CLASS 139

425 A 4,408,637
4,408,638

CLASS 140

71.5 4,408,639

CLASS 141

1 4,408,640
82 4,408,641

CLASS 144

286 A 4,408,642

CLASS 148

2 4,409,036
6.14 R 4,409,037
12.7 A 4,409,038
31.55 4,409,041
129 4,409,042
403 4,409,043

CLASS 149

2 4,409,044

CLASS 150

55 4,408,644

CLASS 152

172 4,408,645
179 4,408,646
330 RF 4,408,647
353 C 4,408,648
367 4,408,649

CLASS 156

69 4,409,045
73.6 4,409,046
92 4,409,057
138 4,409,047
155 4,409,048
164 4,409,049
172 4,409,050
212 4,409,051
227 4,409,052
287 4,409,053
293 4,409,054
307.5 4,409,055
334 4,409,056
361 4,409,058
397 4,409,059
497 4,409,060
502 4,409,061
518 4,409,062
542 4,409,063

CLASS 159

47.1 4,409,064

CLASS 160

121 R 4,408,650

CLASS 162

9 4,409,065
88 4,409,066

CLASS 164

316 4,408,651
459 4,408,652
463 4,408,653

CLASS 16

1 4,408,656
4,408,657
2 4,408,658
10 4,408,654
4,408,659
21 4,408,660
104.27 4,408,655
164 4,408,661

CLASS 166

124 4,408,662
259 4,408,663
263 4,408,664
266 4,408,665

CLASS 172

19 4,408,666
722 4,408,667

CLASS 173

139 4,408,668

CLASS 174

15 S 4,409,425
21 R 4,409,426
36 4,409,427
43 4,409,428
4,409,429
92 4,409,430
103 4,409,431
172 4,409,432
4,409,433

CLASS 175

258 4,408,669
298 4,408,670
377 4,408,671

CLASS 178

22.19 4,409,434

CLASS 179

2 DP 4,409,437
18 HB 4,409,438
84 C 4,409,439
90 BD 4,409,440
111 R 4,409,441
156 R 4,409,442

CLASS 180

89.14 4,408,672
141 4,408,673
227 4,408,674
296 4,408,675

CLASS 181

113 4,408,676
121 4,408,677
199 4,408,678
243 4,408,679

CLASS 182

68 4,408,680

CLASS 188

73.38 4,408,681
202 4,408,682

CLASS 192

11 4,408,683
53 G 4,408,684
85 A 4,408,685

CLASS 198

433 4,408,686
491 4,408,687
500 4,408,688

CLASS 200

83 N 4,409,443
144 R 4,409,444
4,409,445
147 R 4,409,446
148 A 4,409,447
153 LA 4,409,448
153 SC 4,409,449
159 B 4,409,450

CLASS 201

1 4,409,067

CLASS 202

85 4,409,068

CLASS 204

1 T 4,409,069
4 4,409,070
15 4,409,071
57 4,409,072
67 4,409,073
98 4,409,074
129.3 4,409,075
130 4,409,076
159.15 4,409,077
188 4,409,078
192 C 4,409,079
196 4,409,080
197 4,409,081
213 4,409,082
245 4,409,083
257 4,409,084
4,409,085
269 4,409,086
290 R Re.31,410
298 4,409,087
402 4,409,088

CLASS 206

45.17 4,408,689
222 4,408,690
382 4,408,691
438 4,408,692
461 4,408,693

CLASS 208

8 LE 4,409,089
11 LE 4,409,090
4,409,091
89 4,409,092
108 4,409,093
121 4,409,094
134 4,409,095

CLASS 209

10 4,409,096
11 4,409,097
172.5 4,409,098
399 4,409,099

CLASS 210

219 4,409,100
266 4,409,101
603 4,409,102
638 4,409,103
673 4,409,104
679 4,409,105
732 4,409,106
758 4,409,107

CLASS 215

276 4,408,694

CLASS 219

10.49 R 4,409,451
10.55 A 4,409,453
10.55 E 4,409,452
4,409,454
10.81 4,409,455
64 4,409,456
69 D 4,409,458
69 M 4,409,457
86.24 4,409,459
93 4,409,460
111 4,409,461
121 ED 4,409,462
121 LG 4,409,463
136 4,409,464
137 PS 4,409,465
137 R 4,409,466
494 Re.31,415

CLASS 220

3.3 4,408,695
3.6 4,408,696
279 4,408,697
306 4,408,698

CLASS 222

149 4,408,699
153 4,408,700
4,408,701
212 4,408,702
284 4,408,703
312 4,408,704
341 Re.31,408

CLASS 224

39 4,408,705
192 4,408,706
239 4,408,707

CLASS 228

139 4,408,708
183 4,408,709

CLASS 229

15 4,408,710

CLASS 235

58 CF 4,409,467
404 4,409,468
463 4,409,469
472 4,409,470
492 4,409,471

CLASS 236

11 4,408,711
13 4,408,712
49 4,408,713

CLASS 237

2 B 4,408,715
12.3 C 4,408,714
55 4,408,716

CLASS 239

18 4,408,717
88 4,408,718
102 4,408,719
149 4,408,720
417 4,408,721
453 4,408,722

CLASS 241

19 4,408,723
46.17 4,408,724
260.1 4,408,725

CLASS 242

7.09 4,408,726
56 R 4,408,727
84.2 A 4,408,728
84.5 A 4,408,729
96 4,408,730
131 4,408,731
192 4,408,732
199 4,408,733

CLASS 244

3.13 4,408,734
3.22 4,408,735
100 R 4,408,736
110 D 4,408,737
122 R 4,408,738
137 R 4,408,739
158 R 4,408,740

CLASS 248

68 CB 4,408,741
74 R 4,408,742
285 4,408,743
636 4,408,744

CLASS 250

201 4,409,472
206 4,409,473
207 4,409,474
224 4,409,475
227 4,409,476
4,409,477
236 4,409,478
237 G 4,409,479
252.1 4,409,480
270 4,409,481
282 4,409,482
332 4,409,483
363 S 4,409,484
374 4,409,485
396 ML 4,409,486
398 4,409,487
432 PD 4,409,488

CLASS 251

357 4,408,745

CLASS 252

8.5 C 4,409,108
8.55 D 4,409,110
8.8 4,409,109
30 4,409,111
33.4 4,409,112
42 4,409,113
75 4,409,114
79.1 4,409,115
91 4,409,116
99 4,409,117
4,409,118
156 4,409,119
389 A 4,409,121
501.1 Re.31,411
4,409,134
514 4,409,135
540 4,409,136
632 4,409,137

CLASS 254

344 4,408,746
382 4,408,747

CLASS 256

11 4,408,748
67 4,408,749

CLASS 260

112 R 4,409,138
4,409,139
112.5 R 4,409,140
4,409,141
160 4,409,142
205 4,409,143
236.5 4,409,144
239 BD 4,409,145
239.3 R 4,409,146
245.2 T 4,409,147
409 4,409,148
429 R 4,409,149
465 D 4,409,150
502.5 E 4,409,151
543 P 4,409,152
946 4,409,153

CLASS 264

0.5 4,409,157
1.5 4,409,154
3 R 4,409,155
4.33 4,409,156
8 4,409,158
39 4,409,159
40.1 4,409,160
4,409,161
41 4,409,162
45.5 4,409,163
50 4,409,164
53 4,409,165
72 4,409,166
102 4,409,167
104 4,409,168
107 4,409,169
113 4,409,170
120 4,409,171
209.2 4,409,172
210.2 4,409,173
313 4,409,174
517 4,409,175
527 4,409,176
531 4,409,177
544 4,409,178

CLASS 266

216 4,408,750

CLASS 267

120 4,408,751

CLASS 269

8 4,408,752
4,408,753

CLASS 270

52 4,408,754
4,408,755

CLASS 271

288 4,408,756
311 4,408,757

CLASS 272

85 4,408,758
131 4,408,759

CLASS 273

73 D 4,408,760
85 R 4,408,761
121 A 4,408,762
286 4,408,763
341 4,408,764

CLASS 277

3 4,408,765
4,408,766
27 4,408,767
84 4,408,768
105 4,408,769
140 4,408,770
206 R 4,408,771

CLASS 280

1 4,408,772
47.26 4,408,774
95 R 4,408,775
261 4,408,776
461 A 4,408,777
509 4,408,778
607 4,408,779
611 4,408,773

CLASS 281

15 R 4,408,780

CLASS 282

27.5 4,408,781

CLASS 283

70 4,408,782

CLASS 285

3 4,408,783
24 4,408,784
49 4,408,785
256 4,408,786
305 4,408,787
419 4,408,788

CLASS 290

1 R 4,409,489
4 D 4,409,490

CLASS 292

268 4,408,789

CLASS 293

122 4,408,790

CLASS 294

1 R 4,408,791

CLASS 296

1 S 4,408,792
181 4,408,793
198 4,408,794
218 4,408,795

CLASS 297

85 4,408,796
218 4,408,797
285 4,408,800
326 4,408,798
361 4,408,799
433 4,408,801
452 4,408,802

CLASS 301

5.7 4,408,803
37 R 4,408,804

CLASS 303

6 A 4,408,805

CLASS 307

77 4,409,491
108 4,409,492
132 R 4,409,493
238.3 4,409,494
290 4,409,495
296 R 4,409,496
360 4,409,497
454 4,409,498
468 4,409,499
490 4,409,500
594 4,409,501

CLASS 308

6 R 4,408,806
187 4,408,807
4,408,808
187.1 4,408,809
226 4,408,810

CLASS 310

61 4,409,502
75 D 4,409,503
87 4,409,504
90 4,409,505
166 4,409,506
205 4,409,507
239 4,409,508
317 4,409,509
334 4,409,510

CLASS 312

37 4,408,811
242 Re.31,409
256 4,408,812

CLASS 313

3.5 4,409,511
4,409,512
4,409,513
4,409,514
477 R 4,409,515
579 4,409,516
631 4,409,517

CLASS 315

3.5 4,409,518
4,409,519
39 4,409,520
57 4,409,521
308 4,409,522
371 4,409,523

CLASS 318

138 4,409,524
139 4,409,525
254 4,409,526
341 4,409,527
345 D 4,409,528
631 4,409,531
653 4,409,529
685 4,409,530
749 4,409,532
807 4,409,533
811 4,409,534
4,409,535

CLASS 320

2 4,409,536
7 4,409,537
11 4,409,538

CLASS 322

28 4,409,539

CLASS 323

369 4,409,540

CLASS 324

51 4,409,541
57 Q 4,409,542
57 R 4,409,543
4,409,544
107 4,409,545
158 P 4,409,546
4,409,547
168 4,409,548
262 4,409,549
300 4,409,550
349 4,409,551
415 4,409,552
445 4,409,553

CLASS 328

14 4,409,554
4,409,555

CLASS 330

75 4,409,556
277 4,409,557
288 4,409,558
295 4,409,559
296 4,409,560
300 4,409,561

CLASS 331

1 A 4,409,562
11 4,409,563
16 4,409,564
40 4,409,565

CLASS 333

26 4,409,566
151 4,409,567
156 4,409,568
177 4,409,569
187 4,409,570
196 4,409,571

CLASS 335

8 4,409,572
16 4,409,573
18 4,409,574
160 4,409,575
170 4,409,576
202 4,409,577
210 4,409,578
216 4,409,579
243 4,409,580
284 4,409,581

CLASS 337

231 4,409,582

CLASS 339

38 4,408,813
59 M 4,408,814
95 R 4,408,815
143 R 4,408,816
147 C 4,408,818
147 R 4,408,817
154 A 4,408,819
156 R 4,408,820
177 R 4,408,821
4,408,822
208 4,408,823
258 R 4,408,824

CLASS 340

22 4,409,583
4,409,584
52 R 4,409,585
58 4,409,586
347 DD 4,409,587
384 R 4,409,588
396 4,409,589
533 4,409,590
731 4,409,591
825.5 4,409,592
4,409,593

CLASS 343

399 4,409,594
771 4,409,595

CLASS 346

1.1 4,409,596
35 4,409,597
74.2 4,409,598
76 PH 4,409,599
4,409,600
140 R 4,409,601
4,409,602
155 4,409,603
159 4,409,604

CLASS 350

1.7 4,408,825
6.8 4,408,826
96.10 4,408,827
96.23 4,408,828
96.29 4,408,829
117 4,408,835
247 4,408,830
269 4,408,831
310 4,408,832
4,408,833
321 4,408,834
334 4,408,836
336 4,408,837
347 E 4,408,838
347 R 4,408,839
349 4,408,840
425 4,408,841
560 4,408,842

CLASS 351

153 4,408,843
158 4,408,844
160 H 4,408,845
203 4,408,846
211 4,408,847

CLASS 353

11 4,408,848
103 4,408,849
122 4,408,850

CLASS 354

1 4,408,851
24 4,408,852
25 4,408,853
4,408,854
4,408,855
234 4,408,856
4,408,857
4,408,858
274 4,408,859
293 4,408,860

CLASS 355

3 CH 4,408,865

3 DD 4,408,862
3 TE 4,408,864
3 TR 4,408,861
4,408,863
4,408,866
8 4,408,867
14 R 4,408,868
4,408,869
4,408,871
14 SH 4,408,870
28 4,408,872
36 4,408,873
52 4,408,874
53 4,408,875
54 4,408,876

CLASS 356

38 4,408,877
43 4,408,878
155 4,408,879
338 4,408,880
347 4,408,881
350 4,408,882
355 4,408,883
4,408,884
401 4,408,885

CLASS 357

2 4,409,605
13 4,409,606
23 4,409,607
34 B1 4,266,236
51 4,409,608
55 4,409,609

CLASS 358

12 4,409,610
22 4,409,611
24 4,409,612
51 4,409,613
76 4,409,614
111 4,409,615
4,409,616
147 4,409,617
183 4,409,618
224 4,409,619
228 4,409,620
260 4,409,621
4,409,622
261 4,409,623
285 4,409,624
288 4,409,625
338 4,409,626

CLASS 360

38.1 4,409,627
73 4,409,628
99 4,409,629
4,409,630
114 4,409,631
123 4,409,632
127 4,409,633
137 4,409,634

CLASS 361

62 4,409,635
87 4,409,636
119 4,409,637
152 4,409,638
167 4,409,639
197 4,409,640
386 4,409,641
433 4,409,642

CLASS 362

157 4,409,643
200 4,409,644
4,409,645
319 4,409,646

CLASS 363

27 4,409,647
54 4,409,648

CLASS 364

144 4,409,649
193 4,409,650
200 4,409,651
4,409,652
4,409,653
4,409,654
4,409,655
4,409,656
401 4,409,657
424 4,409,658
475 4,409,659
510 4,409,660
516 4,409,661
557 4,409,662
561 4,409,663
565 4,409,664
707 4,409,665
710 4,409,666
732 4,409,667
745 4,409,668
900 4,409,669
4,409,670
4,409,671

CLASS 365

149 4,409,672
180 4,409,673
190 4,409,674
201 4,409,675
4,409,676
206 4,409,677
4,409,678
227 4,409,679
233 4,409,680

CLASS 366

13 4,408,886
75 4,408,887
83 4,408,888
113 4,408,889
155 4,408,890
265 4,408,891
337 4,408,892
339 4,408,893

CLASS 367

166 4,409,681

CLASS 368

93 4,408,894
118 4,408,895
185 4,408,896
200 4,408,897
220 4,408,898
273 4,408,899
295 4,408,900
321 4,408,901

CLASS 369

3 4,409,682

CLASS 370

112 4,409,683

CLASS 374

27 4,408,902
121 4,408,903
137 4,408,904
157 4,408,905

CLASS 375

116 4,409,684

CLASS 376

302 4,409,179

CLASS 377

20 4,409,685

CLASS 381

15 4,409,436
71 4,409,435

CLASS 382

8 4,409,686

CLASS 383

70 4,408,643

CLASS 400

104 4,408,906
120 4,408,908
124 4,408,907
144.2 4,408,909
207 4,408,910
208 4,408,911
4,408,912
4,408,913
4,408,914
290 4,408,915
613.2 4,408,916
637.2 4,408,917
697.1 4,408,918

CLASS 401

12 4,408,919
176 4,408,920
198 4,408,921

CLASS 403

12 4,408,922
20 4,408,923
23 4,408,924
27 4,408,925
310 4,408,926
320 4,408,927
405 4,408,928

CLASS 405

166 4,408,929
209 4,408,930
213 4,408,931
227 4,408,932

CLASS 408

8 4,408,933
51 4,408,934
206 4,408,935

CLASS 411

3 4,408,936
42 4,408,937
71 4,408,938
112 4,408,939
258 4,408,940
378 4,408,941

CLASS 414

24.5 4,408,942
138 4,408,943
216 4,408,944
325 4,408,945
424 4,408,946
526 4,408,947
545 4,408,948
694 4,408,949
749 4,408,950

CLASS 415

36 4,408,951
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	309	270,870	D7—	28	270,886		81	270,902		20	270,918			270,934		19	270,950
D3—	23	270,871		137	270,888		91	270,903		22	270,919	D23—	43	270,935		62	270,951
	71	270,872			270,889	D11—	164	270,904	D21—	5	270,920		49	270,936	D27—	51	270,952
		270,873			270,890	D12—	14	270,905		15	270,921		97	270,937			270,953
D6—	31	270,874		139	270,891		162	270,906		31	270,922			270,938	D28—	35	270,954
	36	270,875		336	270,892		316	270,907		45	270,923		138.5	270,939		60	270,955
	48	270,876		359	270,887	D14—	6	270,908		122	270,924		153	270,940		91.1	270,956
	56	270,877		409	270,893		30	270,909		191	270,925		155	270,941	D29—	7	270,957
	94	270,878	D8—	01	270,894		66	270,910		239	270,926		158	270,942	D30—	35	270,958
	114	270,879		89	270,895		100	270,911		244	270,927		163	270,943			270,959
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	181	270,881		395	270,897		69	270,913	D22—	13	270,929		34	270,945		53	270,961
	234	270,882		429	270,898	D16—	32	270,914		19	270,930		45	270,946	D34—	23	270,962
	246	270,883	D10—	2	270,899		42	270,915		23	270,931		57	270,947		40	270,963
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06 : 5,117

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